European Association for
Computer-Assisted Language Learning

# CALL for Humanity

## EUROCALL 2024

## Short Papers

Edited by Yazdan Choubsaz, Paz Díez-Arcón, Ana Gimeno-Sanz, Jakub Hriňák, Xénia Liashuk, Silvia Pokrivčáková and Hana Vančová

26-29 August 2024. Trnava University, Trnava, Slovakia

edUPV
Universitat Politècnica de València

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# Preface

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The 2024 EUROCALL Conference was held in Trnava, Slovakia, from August 26th to 29th, as a hybrid event with on-site and online participants. The conference took place on the premises of Trnava University and was co-organised by the nonprofit organisation Slovakedu, o.z.

This year's EUROCALL conference focused on humanity in language learning, aligning closely with today's global societal challenges. The theme chosen for the EUROCALL 2024 conference, *CALL for Humanity*, opens up two important discussion points. Firstly, it considers the new role of artificial intelligence, which is gradually increasing its influence on language learning. Secondly, it reflects on issues recently experienced by learners in emergency remote learning, highlighting the challenges in distance education.

The conference theme was central to the first co-hosting institution, Trnava University. This modern University draws on the historical Trnava University established in the first half of the 17th century, making it one of the oldest universities in Slovakia. The modern university has five humanity-oriented faculties and is known for its strong tradition of guiding students with a humanistic approach. Additionally, the university actively contributes to research and development in humanities and related disciplines. The second co-organiser, Slovakedu, o.z., an independent nonprofit organisation, has been involved in teacher education, research, publishing and international cooperation since 2007.

The 2024 EUROCALL conference connected approximately 200 speakers from over 30 different countries, who were able to meet in person and were also joined by online participants. The conference programme included 4 pre-conference workshops, followed by a three-day programme with 3 plenary keynote speakers, 126 parallel sessions, as well as 4 European projects meetings, 10 symposia, 2 poster sessions and an editors' panel with representatives from the most prominent CALL journals around the world. In addition, 11 EUROCALL special interest group meetings took place.

The three outstanding plenary keynote sessions all highlighted the importance of humanity from different perspectives:

**Branislav Bédi**, from the Árni Magnússon Institute for Icelandic Studies, where he works as a coordinator for teaching Icelandic in higher education around the world, as well as being a CALL instructor at the University of Iceland, addressed "The Renaissance of Humanities in a Technology-Driven Society". He reflected on the rising opportunities and challenges of Artificial Intelligence in language learning today and its impact on innovation and personalisation of the learning process while making it more approachable for learners and teachers. His talk also highlighted role of hamanity in using modern technologies, which eliminate learners' temporal and spatial limitations.

**Phil Hubbard**, Senior Lecturer Emeritus at Stanford University, USA, presented an enlightening talk entitled "CALL: We Make the World Better". He discussed the three aspects of making the world better. Firstly, through better communication; secondly, by learning foreign languages; and thirdly, by using CALL to learn foreign languages better, which in sum makes CALL a tool for making the world better. In the address, the direct and

 

indirect roles that individuals adopt in this process were disentangled. However, this process faces challenges on personal, institutional, and ethical levels. The talk inspired the listeners to make the world better by using CALL.

**Yuliana Lavrysh**, Professor at Igor Sikorsky Kyiv Polytechnic Institute, Ukraine, joined the audience online with her talk entitled "Education for Peace Through Internationalization at Universities and Virtual Exchanges: Key Educator Competences". In her address, she raised the question of the importance of education for peace, especially with the rise of globalisation and internationalisation. Virtual exchanges were described as an important mechanism that make education more accessible. She also provided practical recommendations for teachers in developing intercultural competencies, digital literacy, understanding global issues and the concept of peacebuilding.

The conference programme confirmed the timeliness of the topics addressed by the keynote speakers, as many presentations referred to the growing role of artificial intelligence in language education, using technology for improvement, adopting virtual reality in the context of globalised language learning, and developing new collaborative relationships between individuals and institutions.

The conference contributions reveal two main trends. One portion explores how to organise and manage learning better, use technology to enhance face-to-face sessions, and make online learning more effective. The second trend focuses on selecting the right tools to meet specific learning goals. This includes achieving specific skills, creating inclusive learning environments, and providing learners with accurate, timely feedback. These two noticeable trends further highlight the potential of technology to make effective education, aligning tools and methodologies to boost overall learning outcomes.

We would like to thank all of the conference participants, keynote speakers, presenters and session chairs. Furthermore, we would like to thank the EUROCALL Executive Committee for their invaluable support, the Conference Programme Committee for their generous hard work, and the Local Organising Team, including our wonderful student helpers.

This volume includes 49 selected short papers delivered at the EUROCALL 2024 Conference and it offers a combination of research studies and theoretical perspectives organized into 12 thematic strands. We would like to thank both the authors and the reviewers for their time and effort in ensuring that high scientific standards have been met in delivering this volume. Finally, we would like to warmly thank editors **Yazdan Choubsaz**, **Paz Díez-Arcón**, **Ana Gimeno-Sanz, Jakub Hriňák**, **Xénia Liashuk**, and **Silvia Pokrivčáková** for their support in publishing this volume and, very specially to the Universitat Politècnica de Valencia, Spain, for hosting the publication on its open access repository.

 

# Application of theories and frameworks supporting CALL

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# Methodology of research syntheses in CALL

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***Abstract***

*The authors of this paper have shared insights from their recent publications in two prestigious journals to draw attention to the need for good practices in conducting syntheses in CALL. The first author discusses 148 high-visibility journal articles on data-driven learning and looks at how such papers can be analyzed as a corpus to complement and refine themes detected from traditional coding (Boulton & Vyatkina, 2024). Keywords/n-grams and distributions in the past five years have evolved over time, especially regarding methodology. The second author investigates high-impact papers published in four major CALL journals to trace the evolution of the field (Choubsaz et al., 2024). The focus is on how Google Scholar citation metrics are adopted to assess the impact of papers and thus assist the authors in narrowing down a large corpus to a manageable dataset. The third author discusses two major synthetic studies (Gillespie, 2020; the second in preparation), which are seen as significant in detecting key historical trends of research development in CALL and in revealing areas that are under-researched. Finally, the fourth author reports on a scientometric analysis of 4,631 CALL articles published across 63 journals (Mohsen et al., 2024). The research identifies the most prevalent research themes using reference co-citation analysis and investigates the most influential publication sources through source co-citation analysis.*

***Keywords:*** *research syntheses; research methodology; CALL journals; CALL research.*

## 1. Introduction

With the exponential growth of CALL publications – conference proceedings, chapters, books, masters' theses, and doctoral dissertations as well as research articles (RAs) – a diverse range of secondary research (Chong & Plonsky, 2024) has been conducted to shed light on CALL research and its various subfields. Part of this valuable literature measures the weight of technology in CALL (e.g. Shadiev & Liu, 2023), identifies its emergent research or historical trends (e.g. Li, 2022), and investigates high-impact/influential RAs (e.g. Lai, 2019) to expose CALL readers to prime research synthetic practices. However, after years of conducting secondary research in the realm of CALL, and owing to various approaches or techniques that authors apply to synthesize CALL research, it is timely that the current practices in following a rigorous methodology be discussed in major CALL conferences. That was the main rationale behind organizing a symposium on research

 

synthesis methodology in CALL at the EUROCALL 2024 Conference for the four symposium presenters, and authoring a joint paper to share insights from their recent publications in two prestigious journals – three papers published in *ReCALL* and one in *TESOL Quarterly*. The ultimate aim is to discuss the unique methodological aspects of each of these syntheses (ordered alphabetically based on the authors' last names in the Method section below) to provide a roadmap for future CALL synthetic studies.

## 2. Method

With a focus on empirical Data-Driven Learning (DDL) research, defined as studies that evaluate some aspect of the explicit use of corpus tools and techniques for L2 learning or use, Boulton and Vyatkina (2024) argue that scientific quality is a major methodological issue in applied linguistics. Although most scholars realize the meaning of quality in scientific publications, there has always been the need to apply criteria to be able to measure such terms empirically. By drawing on some established quantitative measures,[1] the authors decided to limit the scope of their synthesis to RAs published in journals ranked in Journal Citation Reports (JCR) (2022) for Linguistics and Education. After searching for relevant keywords (*DDL*, *data-driven*, *corpus/corpora*, *concordanc**), 148 papers published in English were recorded and then manually analyzed by the authors to update the existing coding sheet in Boulton and Vyatkina (2021). The final dataset of papers was then converted into txt format to provide a subcorpus of only the Methodology sections totaling 252,326 words. By adopting keyword and key n-gram lists, Boulton and Vyatkina (2024) managed to analyze recurring methodological themes in the past five years compared to earlier publications, a dual approach (coding plus corpus analysis) that allowed them to triangulate the results of their research and specify some unique aspects that a single approach to analysis could miss. They acknowledge though that every stage of the process – defining the field, establishing inclusion criteria, designing a coding sheet, corpus compilation, data analysis, and interpretation – involves choices that others might make differently.

Choubsaz et al.'s methodology (2024) is similar to Boulton and Vyatkina's (2024) in that both studies refer to prestigious resources to assess the quality of the RAs they include in their final dataset; however, Choubsaz et al. concentrated on the papers with the highest impact in the field to trace the evolution of CALL research over decades. Owing to the vast number of publications, the first step for the authors had been to establish a cut-off point to keep the study size within reasonable bounds: Scimago Journal and Country Rank (SJR) and JCR were consulted and only Quartile 1 (Q1) journals (*ReCALL*, *CALL*, *LL&T*, and *CALICO Journal*) were included; *System* was excluded owing to its wider remit in both technology-mediated language learning and applied linguistics (Lei & Liu, 2019). The potential pool of data consisted of all 2,397 RAs published in English in these four major CALL journals from the first issue to the end of 2019. Working with thousands of RAs was not feasible for the purposes and methodologies the authors had in mind. Consequently, Google Scholar citation metrics of all 2,397 RAs were manually checked, their citations over time recorded, and the final dataset formed with the top 15% of widely cited papers (including papers with equal ranks) from each individual year. This novel approach minimized the time bias as papers published in a given year were only in competition with each other, and not with papers published in earlier years which would thus have had more time to accumulate citations. Including only the top 15% of widely cited papers provided a principled way to reduce the number of studies for the synthesis, resulting in 426 high-impact papers in the field.

Choubsaz et al. (2024) acknowledge building on Gillespie's approach back in 2020 (extended in 2024, in preparation) to detect broad trends in CALL research and identify the sector's strengths and weaknesses. In his integrative synthesis, Gillespie (2020) examined 777 RAs over an extensive period, potentially all published RAs from three CALL core journals, *ReCALL*, *CALICO Journal*, and *CALL*, from 2006 to 2016. The journals and their articles were included for their decades of publication in the field of CALL, their connections with regular/major CALL conferences, the large number of international scholars published in them, and the author's familiarity with them as a reviewer. The inclusion of *LL&T* was considered, one of the top CALL journals with a

[1] Xu et al. (in press), for example, recommend combining objective and subjective indices such as journal impact factor and ratings of journals by researchers.

 

constant high impact factor and Cite Score, but eventually disregarded to keep the study size within reasonable limits. Nevertheless, given the importance of *LL&T* and its role in the evolution of CALL research, its Discussion sections were considered in the investigation, the emerging trends were recorded and used as a yardstick to test the author's thematic analysis of the content of the other three CALL journals. Gillespie's more recent survey, yet to be finally completed, has continued the mainly quantitative methodology of the 2020 interactive synthesis, now including *LL&T* fully in order to make it more representative. The intention of this ongoing work is to consider trends in CALL so as to identify new research areas, disappearing research, research amalgamations, and neglected areas alongside considering the geographical strengths of CALL.

Part of Mohsen et al.'s (2024) methodology is also similar to those of Choubsaz et al. (2024) and Boulton and Vyatkina (2024), in that the authors relied on SCOPUS for data retrieval. However, unlike the previously mentioned syntheses that concentrated on a subfield of CALL, high-impact publications in CALL, or a sustained period in the history of CALL research, Mohsen et al. synthesized CALL research over 42 years by employing a scientometric analysis of sources and document co-citation analysis. With a timespan limit from 1980 to 2021, the authors identified 4,631 RAs published in 63 peer-reviewed journals, collectively containing 186,589 references. This enormous quantity represents a substantial chunk of CALL research, allowing the authors to cast light on the most trending research issues in the field and highlight the most influential co-cited sources and RAs, and was made possible by the specific tools used. Employing CiteSpace to identify clusters and VOSviewer to analyze keyword occurrence and co-citation analysis were among the other novel methodological approaches that the authors adopted to identify hotspots in CALL research and analyze the productivity and co-citation frequencies of authors and journals.

## 3. Results and discussion

The results indicate that DDL research has grown globally over the past 30+ years, especially in Asia. The majority of studies focus on upper-intermediate or advanced university-level EFL contexts. Writing is the most researched language skill, followed by vocabulary and lexicogrammar. Empirical studies dominate, with quantitative methods being the most common. The corpus analysis and the key words/n-grams highlight preoccupations such as research design, methodology, and specific corpus tools. The authors note that, while DDL research has increased tremendously, many studies need to employ more rigorous research in terms of design, duration, and data triangulation, as well as reporting practices (for duration and proficiency in particular, as well as what the learners did, and should provide full data sets in supplementary materials). They highlight the need for more diverse research contexts, including younger learners and less commonly taught languages. The authors also emphasize the importance of engaging more deeply with theory, particularly in areas like learner autonomy and cognitive depth, touted as major advantages of DDL but rarely featuring as overt research questions. They suggest future research should expand to other skills, methodologies, and cultural aspects of language learning, calling for more creativity in research design to test DDL's foundational principles.

Similar to Boulton and Vyatkina (2024), Choubsaz et al. (2023) found that CALL research has been expanding globally, particularly in Asia. The predominant approach used in these studies was qualitative and eclectic, but there is a growing trend towards employing mixed methods research in CALL studies. Interestingly, the authors discovered that nearly 20% of the studies reviewed lacked a solid theoretical foundation, despite the majority of them referencing socio-cultural and interaction theory as their theoretical framework. In line with Boulton and Vyatkina (2024), Choubsaz et al. found that the most extensively researched topic in CALL studies was writing, followed by computer-mediated communication and vocabulary. They pointed out both positive trends and persistent challenges in the field of CALL research, with encouraging developments such as increased international participation, improved methodological rigor, and a growing emphasis on theory-driven research. However, they also identified ongoing issues, including a narrow focus on a limited number of topics and contexts, primarily centered around English language learners at the university level. To address these issues, the authors of the study suggested expanding the scope of CALL research to include less-studied areas, enhancing the quality and scale of empirical projects, and engaging more deeply with theoretical frameworks. They also

 

stressed the need for more research on advanced language skills and cultural content, advocating a more balanced representation of research topics and contexts in the existing CALL literature.

Again similar to Boulton and Vyatkina (2024) and Choubsaz et al. (2023), Gillespie (2020) found that CALL research is growing internationally, covering a wide range of topics. However, some areas received special focus, including writing, computer-mediated communication, vocabulary, and speaking. Like Boulton and Vyatkina, Gillespie also found most empirical studies to be small-scale, often conducted in one setting with a small number of participants and over short-term experiments. Therefore, he suggested conducting more rigorous research designs, involving larger samples, and using longer interventions to reach more reliable findings. He also highlighted the need for CALL studies to engage more deeply with cultural aspects of language learning and advanced language skills, areas currently lacking in CALL research. He proposes that CALL researchers should think more strategically about their research choices, considering all levels of language learning and teaching, from beginner to advanced. Gillespie's 2024 study notes the persistence of inadequate research design and the ongoing neglect of key areas of language learning, the continued concentration of research in an increasingly limited number of areas, and considers whether these developments are positive.

Mohsen et al. (2024) identified several significant clusters in CALL research, with a pronounced focus on writing among CALL scholars. Other prominent areas included MALL learning, synchronous computer-mediated communication, and DDL, suggesting a learner-centered approach. Unlike Boulton and Vyatkina, the analysis here revealed that CALL research more broadly is supported by robust theoretical frameworks, particularly socio-cultural and SLA theories. Mohsen et al. found that core-CALL journals outperformed other applied linguistics and educational technology journals in terms of productivity and h-index. The analysis of 42 years of CALL research revealed emerging areas such as flipped classrooms, intercultural competence, and immersive technologies. The authors highlight the interdisciplinary nature of CALL research, intersecting applied linguistics and educational technology. They suggest that future research should explore emerging technologies like artificial intelligence and conduct more comparative analyses of research topics across different journal types. They also emphasize the need for more comprehensive syntheses that include journals in other indices and address specific features such as research designs employed in the field.

## 4. Conclusions

This paper arose from a joint concern to address current practices in synthetic CALL studies, each of which involves its own individual aims and choices. The authors share their experiences in producing their own syntheses. One of the first concerns is inclusion – not just the scope of CALL research to cover, but also publication types, period, and sources. Such decisions are motivated as much by logistical as by scientific considerations, i.e. the need to reduce the pool to a manageable size, which in turn depends on the aims and, in particular, the instruments used. Some degree of semi-automation can be achieved with tools such as AntConc and NVivo, allowing the synthesist to explore larger datasets than more traditional techniques alone (reading and coding). Approaches such as scientometrics have already been successfully used to expand the possibilities still further. Most recently, GenAI has led to mixed responses about its role in syntheses: Udaya and Reddy's (2024) entirely machine-generated book-length literature review of vocabulary, corpus and language teaching may suggest some new paths, though it is not without its problems; a full discussion of the issues is beyond the scope of this short paper.

In this paper we have contended that research syntheses have a very important role to play in the development and extension of the learning and teaching of CALL. Our work shows that there is a good story to tell, but that there are weaknesses and inadequacies as well. These findings pose a challenge to all us as researchers. Should we merely present them in a descriptive mode, commending good practice? To what extent should we be critical of what we see? Should we seek to advocate for CALL research to move in certain directions? And given the limited uptake of previous recommendations found in Boulton and Vyatkina (2021), we might wonder whether anyone would pay any attention anyway.

 

## Acknowledgements

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# Multimodal digital literacies in L2/FL education: A systematic review of interactive and immersive approaches

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***Abstract***

*This research provides a systematic review of literature on multimodal approaches in second or foreign language (L2/FL) education, focusing on digital literature literacy. It examines how the interactivity, non-linearity, and multimedia aspects of digital literature foster immersive learning, enhancing language acquisition and aligning with learners' digital preferences. Additionally the effectiveness of digital tools for literature in enhancing reading comprehension, vocabulary building and intercultural inclusivity. The main findings emphasise the importance of integrating digital literature into educational contexts, highlighting the myriad of benefits it brings, from improving engagement and accessibility to strengthening information and communication technology (ICT) skills. By exploiting the interactive and multimedia nature of digital literature, educators can offer L2/FL learners a more engaging and contextual learning experience, thus accelerating their language acquisition journey.*

***Keywords:*** *digital narrative; teacher training in CALL; digital literature; interactive language learning; multimedia educational tools.*

## 1. Introduction

In an era characterized by the fusion of technology and education, the use of digital literature in the acquisition of a second language (SL) or a foreign language (FL) emerges as a particularly stimulating field of study. The adoption of digital technologies in language education is a rapidly fast developing area, full of potential but also presenting new challenges for educators. In a context where multimedia platforms and online learning tools are increasingly becoming an integral part of students' daily lives, it is crucial that educational strategies adapt to these changes.

This systematic review, conducted as part of the Erasmus+ KA220 project "DILECTINGS" (DIgital Literature Educational Competences for Teachers: Intercultural iNclusive Good-practices for Second-language learning: https://dilectings.uniroma3.it/) at the University of Rome "Roma TRE," aims to identify and analyze the best practices that have emerged over the past decade, as well as examine how digital skills can be effectively incorporated and developed in language learning contexts.

The findings of this research suggest that interactive and digitally enabled learning environments can foster more immersive and contextualized language acquisition, especially when used to complement traditional teaching. Applications that combine individual practice and collaboration prove effective in strengthening language skills, aligning with student preferences and generating engagement through gamified experiences. However, the

 

research also indicates a trend among adolescents to independently develop these language skills through peer networks rather than in formal educational settings.

This paper presents a comprehensive and systematic review of the existing literature on the use of multimodal approaches in the field of second and foreign language (L2/FL) education, with a particular focus on the area of digital literature literaciy. In particular, it examines the key findings in digital literature as a representative segment of the broader research, which encompasses six thematic areas: Gamified Educational Applications, Literacy, Digital Literature, Digital Reading, Engagement and Motivation, and Artificial Intelligence. The selected studies seek to examine innovative methodologies for developing a conceptual framework to effectively integrate literature and digital reading into L2/FL curricula, with a particular focus on the promotion of intercultural awareness and inclusion.

## 2. Method

### 2.1. Context and participants

The motivation for this research emerges from the evolving landscape of education, where technology permeates every aspect of learning. Over the last twenty years, the widespread adoption of new information and communication technologies (ICT) in education has reshaped the teaching and learning environment. Nevertheless, the proper utilization of ICT is essential to advance educational practices that support sustainable development.

This study is focused on the analysis of educational interventions aimed at the population resident in the European Union (EU). The study's participant groups encompass students from pre-school, primary, and secondary educational levels, as well as teenagers and adolescents between two and seventeen years of age. Furthermore, the target population encompasses both pre-service and in-service teachers. The review includes studies that employ technology-based methodologies across a range of digital media, including tablets, smartphones, and e-books. The use of digital literature, including both original and adapted texts for digital platforms, was considered in these interventions.The sources comprised in the study are diverse, spanning from journal articles and monographs to theses and indexed research papers. In this review were included studies published in English, as well as, in Spanish, Italian, ensuring a comprehensive linguistic representation while maintaining a focus on EU-related educational contexts.

### 2.2. Research Questions and objectives

Our journey in this field is guided by a series of fundamental research questions:

> Q1 How can digital literature and digital reading be effectively integrated into SL/FL education to foster intercultural awareness and inclusion?
>
> Q2 What are the pedagogical implications of incorporating digital literary apps and resources in the classroom?
>
> Q3 How can we leverage technology to address the diverse needs of students, including those with Special Educational Needs?

These questions serve as a compass for our investigation, guiding us through the multifaceted terrain of digital language acquisition, literacy, and cultural inclusion.

### 2.3. Significance of the study

The significance of this study goes beyond the boundaries of language learning and pedagogy. In an era marked by global interconnection and cultural diversity, the ability to communicate effectively across languages and cultures is crucial. Moreover, the European Union's commitment to promoting an inclusive community through education aligns perfectly with the objectives of this research. By exploring the nexus between digital literature,

 

language acquisition, and cultural inclusion, this study enlights how digital technology-assisted learning can facilitate the integration of European citizens, an ambitiuos goal outlined in the Europe 2020 Strategy and the 2030 Agenda.

### 2.4. Scope and limitations

It is essential to clarify the scope and limitations of this study. Although our investigation delves into the potential advantages of digital literature and digital reading in SL/FL education, it cannot encompass every aspect of this dynamic field. Therefore, this research will primarily focus on primary and secondary schools within the European context, recognizing that the nuances and applicability of digital language pedagogy may vary depending on educational levels and regions.

### 2.5. Methodology: Design and approach of the research

A systematic review, at its core, is a meticulous amalgamation of scientific findings spread over a defined period, examined through established selection criteria. The primary goal of this methodical effort is to provide precise answers to specific research questions. Adhering to the rigorous methodology of systematic reviews, this investigation closely followed the renowned Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The PRISMA protocol served as our guiding compass, representing the model for a robust systematic review design, for the selection of articles to be included in the literature review.

#### *2.5.1. Step 1: Defining the research purpose*

The overarching objective of this research effort revolves around conducting a thorough examination of academic articles that delve into innovative strategies for promoting digital literature and digital reading in SL/FL education for sustainability as previously defined in the educational context. To achieve this ambitious goal, a series of well-structured research questions were formulated, categorically focused on two key dimensions (Table 1-2-3):

**Table 1.** Dimension and aspects inspected.

| Dimension | Aspects |
|---|---|
| Documentary characteristics | Temporal trends (year of publication), language of the investigated research, geographical diversity (based on the country of the research cluster), and the methodologies employed in the research process. |
| Pedagogical dimension | Sustainable Development Goals (SDGs) explored, educational levels addressed, innovative pedagogical practices in digital literature reading ,expected digital literacy levels. |

**Table 2.** Dimension documentary characteristics , research questions, initial coding.

| **Research questions** | **Initial coding** |
|---|---|
| RQ1. What is the geographical distribution of the investigations? | Country of the first author of the article |
| RQ2. What is the year of publication and the temporal range of the sample? | Year of publication |
| RQ3. What research methodologies are used in the publications? | Journals/questionnaire/case study/grey literature/research |
| RQ4. In which language is the research text written? | Language of the text |

 

**Table 3.** Dimension pedagogical dimension, research questions, initial coding.

| Research questions | Initial coding |
|---|---|
| RQ5. Which Sustainable Development Goals (SDGs) does the research contribute to? | Sustainable Development Goals |
| RQ6. At what educational levels are the selected studies conducted? | Educational levels |
| RQ7. What sustainability challenges does the selected research aim to address? | Sustainability challenges |
| RQ8. What innovative practices are developed in the literature? | Innovative practices |
| RQ9. What strategies for digital literature literacy and digital literature reading have emerged for inclusive second language learning? | Strategies for Digital Literature Literacy, Strategies for Digital Literature Reading |

### 2.6. Selection process and inclusion/exclusion criteria

The selection process utilized keywording alongside Mendeley to remove duplicates.

| |
|---|
| Inclusion Criteria: Articles considered for inclusion met specific criteria, including publication between 2010 and 2023, written in English, Spanish, or Italian, and focused on teaching in a second or foreign language in a digital context. Articles comparing L2/FL with L1 or digital with print were also considered. (c) Experimental studies, case studies, innovative proposals, and grey literature |
| Exclusion Criteria: Studies were excluded if they did not directly contribute to any of the Sustainable Development Goals (SDGs) through the use of Information and Communication Technologies (ICT) and Artificial Intelligence (AI), did not propose relevant innovations, or did not offer specific strategies for digital literary reading to enhance Foreign Language (FL) or Second Language (SL) learning. |

#### *2.6.1. Article search*

The article selection process began with an initial search that yielded over 86 articles. The distribution of these articles across databases was as follows: 16 from EBSCO, 8 from ERIC, 15 from Google, 10 from Scopus, 31 from Semantic Scholar, and 6 from OATD.

The screening process commenced with the elimination of 15 duplicate articles found across the investigated databases. Following this, abstracts were screened using inclusion criteria related to digital literacy, language learning, and the use of Digital Literature Reading as an enhancement strategy for second language learning. This step reduced the number of articles to 60 for full-text review. During this review, 11 articles were excluded because the full text was not accessible, and 26 were excluded as they were not directly related to the subject of this study. Thus, 34 articles remained for further analysis.

Additionally, further resources were identified through the analysis of blogs, university websites, and theses, totaling 6 resources. After thorough evaluation, these additional resources were deemed irrelevant and were not added to the previously selected articles.

 

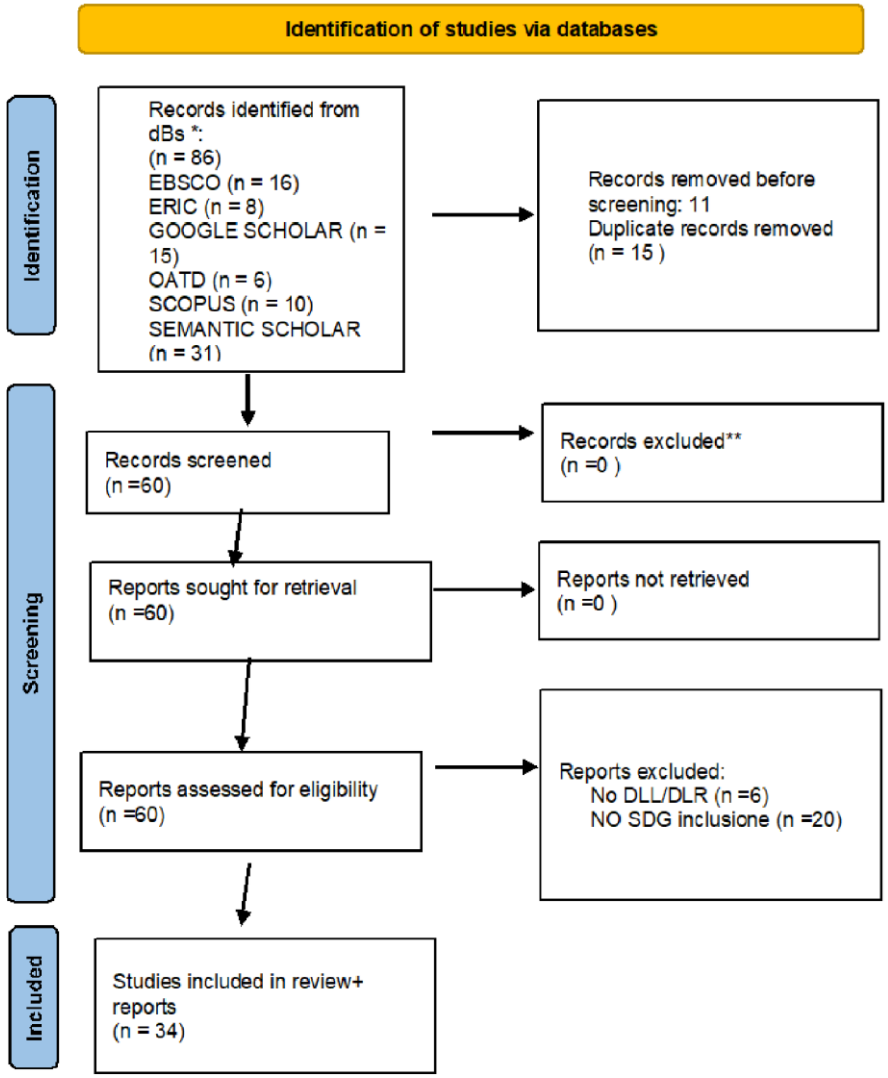


Figure 1. PRISMA 2020 flow diagram from the Preferred Guidelines for Reporting in Systematic Reviews and Meta-Analyses (PRISMA) illustrating the study selection process.[1]

### *2.6.2. Search strategy syntax examples*

The search strategy employed a standardised approach to identify articles in English, Italian, and Spanish from 2010 to 2023, with a particular focus on contemporary research in digital literature and language learning. The search terms included a number of keywords, such as digital literature, digital reading, digital literature literacy (DLL), educational technology, artificial intelligence (AI), and foreign language teaching. A comprehensive search was conducted by combining the aforementioned terms with Boolean operators. Databases including ERIC, the British Education Index, Scopus and grey literature collections (e.g. OADT) were utilised, with supplementary manual and internet searches (e.g. Google Scholar) employed. In order to ensure that the findings presented are as up-to-date as possible, only articles published in the last 13 years were included.

[1]Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71. For more information, visit: http://www.prisma-statement.org/

 

**Table 4.** Sample Search String/teachings Digital Literature in FL/L2 learning.

| | Keyword | Keyword combination |
|---|---|---|
| 1 | DLL Digital Literature Literacy | DLL Digital Literature Literacy + LDR Literature Digital Reading |
| 2 | LDR Literature Digital Reading | DLL Digital Literature Literacy + literacy strategies in teaching |
| 4 | L2 Learning/Teaching | DLL Digital Literature Literacy + FL learning |
| 5 | FL learning//teaching | DLL Digital Literature Literacy + L2/FL Teaching |
| 6 | L2/FL Teaching | DLL Digital Literature Literacy + sustainability SDG4 |

## 3. Results

The descriptive narrative analysis identified six key areas of intervention across the examined studies, emphasising the pervasive role of digital elements in second and foreign language (L2/FL) education. This paper focuses on digital literature, which has emerged as a new form of literary expression that exploits the potential of computing and the internet. Digital literature, or "electronic literature" (e-literature), is a distinct form of literary expression that differs from traditional print literature due to its hypertextual, multimedia, and interactive nature. As De Vivo (2011) observes, digital literature functions as a computational literary form that employs digital media as both an aesthetic and rhetorical device, challenging conventional linear narratives and emphasising active reader participation.

A number of studies have highlighted the potential of digital literature as an educational resource. To illustrate, Padurean (2015) analyses the function of literature in EFL classrooms, investigating the challenges presented by digitalisation and the significance of literature for personal and professional development. Padurean underscores the necessity for innovative pedagogical approaches that integrate literary texts into EFL curricula. Through the study, Padurean explores the underlying causes of students' growing apathy towards reading, assessing the effectiveness of literary texts and teaching methodologies employed. The research focuses on a sample of students enrolled in Romanian language and literature, as well as English language and literature courses, engaging in a critical discussion about the efficiency of using literature in EFL classrooms. It highlights how the linguistic complexity of literary works can pose a barrier to grammatical learning. She proposes methods such as the didactic use of literature, cultural and interdisciplinary approaches, and a communicative model that fosters critical thinking and personal expression.

Similarly, Kucirkova's (2016) study on the digital reading habits of children reveals that the interactive elements of digital books enhance comprehension and vocabulary, thereby contributing to a shift in parental perceptions about digital narratives. This study emphasises the potential of digital reading to foster a love for literature among young readers and improve literacy skills in digital environments.

In other investigations, Lütge et al. (2019) and Skains (2019) explored the pedagogical implications of digital literature. Lütge's work puts forth a typology for integrating digital texts into foreign language curricula, while Skains examines how digital fiction can enhance students' multilingual competencies through experimental writing and current technologies.

Furthermore, Gyoomi and Jiyoung Bae (2020) concentrate on the cognitive processes involved in comprehending digital texts, underscoring the necessity for bespoke pedagogical approaches that are in accordance with individual learning styles. Their research demonstrates the advantages of incorporating digital literature into the curriculum to cultivate multimodal competencies and linguistic proficiency.

 

Cro's (2020) work on integrating digital humanities into language education offers further insight, presenting a multi-tiered pedagogical strategy that combines traditional language teaching with digital innovations. Cro's examples, including the multimodal analysis of Dante's Divine Comedy, illustrate the potential of digital literature to facilitate second language acquisition.

The intrinsic value of literature as a means of acquiring knowledge and facilitating personal growth, as well as the significance of incorporating literature as a central and dynamic component of the educational process, is explored in their 2022 study, "Children's Learning Encounters and Materiality." In this study, Jessel and Dumić investigate the role of materiality in children's learning. This study illustrates the pedagogical potential of integrating printed materials and digital tools to enhance educational experiences. The case study evaluates the process of transforming a printed fairy tale into a digital narrative, as undertaken by three children and their educators. The findings of the research are in alignment with the emerging theories on socio-material learning, which indicate that the interaction between printed materials and digital tools can facilitate new avenues for educational engagement.

Kern (2021) and Heckman (2023) provide further insights into the concept of digital literacy in the context of language education. Kern's work focuses on the evolution of digital literacies in the context of computer-assisted language learning (CALL). It identifies the transformative impact of digital tools on student agency, creative linguistic practices, and new social networks. Heckman reflects on the challenges of integrating e-literature into academic curricula, advocating for flexibility and community support to optimise its pedagogical benefits.

In light of this, we can conclude that digital literature is a rapidly expanding field, redefining the creation, consumption, and teaching of literature in the digital age. Collectively, the reviewed studies highlight the necessity for inclusive, innovative pedagogical strategies that leverage the multimodal and interactive nature of digital literature to enhance language learning and foster student engagement in the digital era.

## 4. Discussion and conclusions

The motivation for this research stems from the evolving landscape of education, where technology increasingly permeates learning processes. Over the past two decades, the adoption of information and communication technologies (ICT) has reshaped teaching and learning environments, and the appropriate utilization of these technologies is essential to advance sustainable educational practices. This systematic review has focused on the digital literature area within second and foreign language (L2/FL) education, analyzing its potential to foster linguistic development and intercultural awareness, particularly in the context of the European Union (EU).

The findings of this systematic review provide valuable insights, addressing the three key research questions posed.

Q1 How can digital literature and digital reading be effectively integrated into SL/FL education to foster intercultural awareness and inclusion?

The review highlights that digital literature, with its hypertextual, multimedia, and interactive characteristics, offers unique opportunities to foster intercultural awareness and inclusion. By allowing students to engage with diverse cultural narratives and global perspectives, digital literature enriches language learning and promotes cultural sensitivity. Studies such as those by Padurean (2015) and Cro (2020) underscore the importance of integrating literary texts that reflect varied cultural contexts, using digital tools to create immersive, context-driven learning environments. These tools allow students to explore socio-cultural dynamics more deeply, supporting the development of intercultural competencies essential for global citizenship.

Q2 What are the pedagogical implications of incorporating digital literary apps and resources in the classroom?

The pedagogical implications of incorporating digital literary apps and resources are profound. The studies reviewed emphasize the effectiveness of using digital literature as a tool for enhancing reading comprehension, vocabulary acquisition, and overall language skills. Kucirkova (2016) demonstrated how interactive elements in

 

digital books engage students, making reading a more dynamic and personalized experience. Additionally, Lütge et al. (2019) and Skains (2019) show that digital fiction and experimental writing platforms can foster creativity and critical thinking, helping students develop essential skills in a multimodal world. Pedagogically, this calls for an active role for teachers, as facilitators who integrate these tools effectively into the curriculum, ensuring that they complement traditional methods and enhance students' learning experiences.

Q3 How can we leverage technology to address the diverse needs of students, including those with Special Educational Needs?

The review underscores the adaptability of digital literature in meeting the diverse needs of students, including those with Special Educational Needs (SEN). Technology offers the flexibility needed to personalize learning experiences, making them more accessible and engaging. As highlighted by Gyoomi and Jiyoung Bae (2020), digital tools can be tailored to individual learning styles and cognitive processes, which is especially beneficial for SEN students. Interactive features, such as customizable text formats and multimodal content, allow learners with varying needs to engage with texts at their own pace, fostering a more inclusive learning environment. The potential for AI-driven personalized learning pathways further enhances the accessibility and effectiveness of digital literature in addressing diverse educational needs.

As a final point, this review has demonstrated that digital literature, when effectively integrated into SL/FL education, has the potential to foster intercultural awareness, improve linguistic competencies, and meet the diverse needs of students, including those with SEN. The pedagogical implications of these findings emphasize the importance of teacher training and curriculum development that systematically incorporate digital tools and resources. Moving forward, further research into personalized learning approaches, alongside the development of innovative digital tools, will be crucial for maximizing the impact of digital literature in an increasingly diverse and digitalized educational landscape.

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# Technology-mediated Task-Based Language Teaching in a Virtual Reality learning environment

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***Abstract***

*Task-based language teaching (TBLT) emphasizes interaction in the target language, bridging classroom learning with real-world language use (Nunan, 2004). TBLT focuses on meaningful, purposeful tasks that reflect authentic language use outside the classroom. With the integration of Web 2.0 technologies, the TBLT framework evolved into Technology-mediated task-based language teaching (TMTBLT) to better incorporate technological advancements (González-Lloret & Ortega, 2014). Recently, emergent technologies like Virtual Reality (VR) have influenced TMTBLT by enhancing the authenticity of language use in realistic, immersive contexts (Smith & McCurrach, 2021). This paper applies the TMTBLT framework to analyze a series of language tasks carried out in VR, focusing on how certain affordances of VR can enhance TMTBLT. The tasks come from an 8-week case study involving six Japanese adult learners. Each week, participants engaged in 30-minute English lessons on the VR language learning platform, Immerse. These lessons were designed according to TBLT principles and included real-world tasks such as ordering food in a virtual restaurant. Video recordings of the lessons (254 minutes) were analyzed to assess task alignment with TMTBLT principles and their impact on learning and interaction. This paper aims to offer practitioners insights on effectively integrating VR into TMTBLT by discussing both the successful and unsuccessful aspects of tasks.*

***Keywords:*** *Technology-mediated task-based language teaching (TMTBLT); Virtual Reality (VR); immersive language learning; metaverse.*

## 1. Introduction

Task-based language teaching (TBLT) is an approach to language learning that emphasizes interaction in the target language, linking classroom learning with real-world language use (Nunan, 2004). Tasks are designed to be purposeful and mimic features of language used in everyday life (e.g., purchasing a ticket at a train station). An integral aspect of TBLT is the focus on meaning over strict grammatical forms, as meaning is primary in all successful interactions.

The rapid technological advancements of the 21st century along with the blending of Web 2.0 technologies as media of instruction led González-Lloret and Ortega (2014) to refine the TBLT framework. Specifically, they coined the term Technology-mediated task-based language teaching (TMTBLT) to give a more congruent

understanding of the relationship between technology and tasks. Indeed, the emergence of innovative technologies like Virtual Reality (VR) and the affordances of specific applications or software may determine what instructors can do with this technology and which teaching approach they will follow (Smith & González-Lloret, 2018) while implementing TMTBLT.

VR can be divided into two distinct categories: low-immersion VR and high-immersion VR (Kaplan-Rakowski & Gruber, 2019). When using low-immersion VR, a user "sees the virtual environment on a screen in front of them, while still being surrounded by the real world. On the other hand, with high-immersion VR, a user is fully visually and auditorily immersed in a virtual 360° environment by means of a VR headset such as the Meta Quest 2." (Sadler & Thrasher, 2023, p. iii). In low-immersion environments, a user navigates the environment typically by means of a keyboard and mouse, whereas in high-immersion environments, a user does so by means of VR controllers which can provide realistic, haptic feedback and create a more immersive experience.

Research has found that VR can be used to enhance TMTBLT. Specifically, it has been shown that purposeful, real-world tasks in social high-immersion VR can increase learner autonomy (Jauregi-Ondarra et al., 2022b) as learners make authentic use of the target language in realistic, simulated contexts from a first-person perspective. Studies have also shown that VR can promote the extent to which users perceive a task to be authentic and foster student engagement (Lee et al., 2023; Lee et al., 2024). Based on the affordances of VR like immersion, interaction, simulation (Lan, 2020) and embodiment (Sadler & Thrasher, 2023), this paper aims to apply the TMTBLT framework to analyze a series of language tasks carried out in VR, focusing on how certain affordances of VR can be harnessed to enhance TBLT.

The data for this paper come from a case study on immersive learning in the metaverse (Thrasher et al., 2024), which focused on the implementation of eight pedagogical tasks in Immerse (https://www.immerse.com/), an educational metaverse language learning platform, over an 8-week period. Participants were 6 L1 Japanese adult students learning English through weekly 30-minute group lessons. All lessons were designed around TBLT principles and, therefore, provided students with a real-world task that they needed to accomplish throughout the lesson (e.g., ordering a meal in a virtual fast-food restaurant). Lessons were video recorded for further analysis and analyzed manually for how well they aligned with TMTBLT principles. The aim of this paper is to apply the TMTBLT framework to VR settings, which to the authors' knowledge has not been used in previous research on VR. By analyzing successful and unsuccessful tasks, this paper advances understanding of how the affordances of VR can be harnessed to design pedagogically-appropriate TMTBLT activities.

## 2. Method

### 2.1 Context and participants

Participants in this case study were employees of a Japanese education company who were given the opportunity through their employer to participate in a VR English program on the Immerse platform. They were all working professionals in the Education industry who chose to participate in this project in an effort to improve their English speaking skills and speaking confidence.

Participants' ages ranged from 30-54 years old. They had various levels of prior experience learning English and self-reported their English proficiency to range from pre-A1 to B2 on the Common European Framework of Reference (CEFR) scale prior to the start of the study.

As part of the program, participants attended 30-minute weekly group lessons with other employees for an 8-week period. These lessons were all designed following TMTBLT principles in order to give employees the chance to practice English in relevant contexts that they could apply directly to their lives. All lessons were led by an experienced language instructor of Immerse. For data collection, all lessons were video-recorded for further analysis which yielded 254 minutes of recordings. Three researchers then transcribed the video recordings using ELAN software and analyzed them manually through detailed field notes and discussions using the TMTBLT framework to understand a) how well they aligned with TMTBLT principles and b) how they impacted students' learning process and interactions with their classmates.

### *2.1.1. Immerse*

Immerse is a social VR platform specifically designed for language teaching and learning. Unlike other VR language learning platforms that focus on solo learning experiences (e.g., Mondly, NounTown), Immerse prioritizes human-to-human interaction and is primarily used for live language instruction. The platform offers over 40 different virtual scenes (e.g., a fast food restaurant, a home, a zoo) where students can meet with teachers and peers to practice their speaking skills in real time.

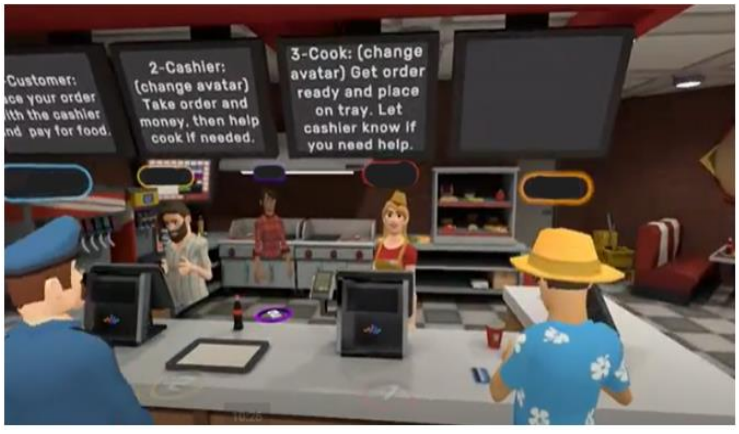
All of Immerse's environments are highly interactive to add realism to the learning experience. For example, in the airport scene, students can scan their passport, print their boarding pass, check in for their flight, go through airport security with their belongings, and be greeted by their flight attendant after they board their plane. These interactions were designed to increase the sense of embodiment that students experience during lessons and to add a sense of realism that can contextualize the language learning process.

Students can use either a computer (low-immersion VR) or a Meta Quest 2, 3, or Pro VR headset (high-immersion VR) to access Immerse. Both modalities give students access to identical content, although the high-immersion version of the platform offers a more immersive, realistic experience. In this study, participants could choose which modality they preferred to use while in lessons.

### *2.1.2. VR-mediated tasks*

Each week, participants' lessons were designed around achieving a single main communicative task and were scaffolded to ensure that participants could successfully complete the task by the end of the 30-minute period. They typically began with an introduction, followed by a presentation of the communicative scenario, sometimes using a whiteboard to have students practice specific grammar, and culminated in a role play or immersive experience that targeted the task at hand. Feedback and reflection time were also incorporated into each lesson. Table 1 gives an overview of the main tasks that participants had to accomplish each week.

**Table 1**. The eight tasks the participants carried out during the 8-week period.

| Week | Task | Visual |
|---|---|---|
| 1 | Both placing and taking down an order at a fast food restaurant. |  |

| | | |
|---|---|---|
| 2 | Discussing frequency of activities and daily routines. |  |
| 3 | Stating a complaint to the waiter/waitress at a restaurant. |  |
| 4 | Talking about future plans with friends. |  |
| 5 | Inviting friends to do something on the weekend and accepting invitations. |  |

| | | |
|---|---|---|
| 6 | Describing animals and their abilities. |  |
| 7 | Navigating airport security and discussing a problem experienced while traveling (e.g., losing luggage) |  |
| 8 | Telling a story about a place the student had visited or lived. |  |

## 3. Findings and Discussion

Gonzalez-Lloret and Ortega (2014) emphasized that the pedagogical approach of TBLT can be enriched by the infusion of new technologies, but also that new technologies can more greatly benefit language learning when motivated by TBLT. They identified five key principles that are necessary for successfully blending technology and TBLT: 1. *Primary focus on meaning*, 2. *Goal orientation*, 3. *Learner-centeredness*, 4. *Holism*, and 5. *Reflective learning*. During the pandemic, when social distancing dictated learners' lives, Gonzalez-Lloret (2020) revised this list by adding a sixth principle: *Tasks should promote true collaboration and learner interaction*. This principle emphasized how TBLT in online spaces can foster meaningful learner interactions through collaborative tasks, which is also a central focus of this paper.

**Applying the 5 TMTBLT principles to participants' VR tasks**

The tasks that participants completed over the 8-week period were analyzed to understand how well they aligned with Gonzalez-Lloret and Ortega's (2014) proposed principles for TMTBLT.
Regarding Principle 1 – "*Primary focus on meaning"*, Gonzalez-Lloret and Ortega (2014) argue that particular language foci should be hidden or implicit from the learners for a good part of the task to avoid spoon-feeding them with specific phrases they are supposed to say. Even though grammatical forms are not the ultimate goal in the first principle, the instructor in the VR-mediated tasks began each lesson by highlighting the grammar focus and giving participants' alternative language structures to follow by writing them down on an interactive board. Initially this grammatical orientation appeared to confuse participants, especially the ones with a lower-level of English, but unlike traditional classrooms, participants were able to, eventually, deviate from strict grammar and produce language forms themselves through interacting with the board (i.e., arranging words into correct categories and phrases) and incorporating objects (i.e. using virtual money to pay for their food, grilling burgers, etc.) that allowed them to have more pragmatic negotiations of meaning-making and engage in more incidental learning activities (González-Lloret, 2020).

The tasks were also "goal-oriented" (Principle 2) with clear objectives that mimicked real-life interactions with concrete outcomes to achieve. As seen in Table 1, the communicative purpose of task 1 was to place an order as a customer and take down an order as an employee. In task 7 participants navigated airport security and communicated a problem they had experienced as customers. The participants in the VR environment did not solely mimic real-life scenarios, they learnt "by doing" (Nunan, 2004), while being immersed in a fast-food restaurant with a menu in front of them or handling a flight problem with airport staff at the check-in. Being less aware of time and more detached from the real world (Lan, 2020), without being confined in conventional learning spaces, enabled participants to become more self-directed and responsible for their own learning (Jauregi-Ondarra et al., 2022b). For example, in task 1, a fast-food role-play, participants practiced placing and taking orders, navigating the challenges of handling virtual money, and even changing avatars to assume different roles, which enhanced "learning-by-doing" of the goal-orientated lesson.

According to Gonzalez Lloret (2020), "tasks need to address learners' needs and wants and they need to engage their linguistic, nonlinguistic, and digital resources, that is, tasks need to be *learner-centered*" (Principle 3) (p. 2). Unlike many VR language learning applications that promote individual experiences, the social platform used in this study enabled participants to meet and interact in this series of immersive lessons in simulated, real-time sessions, and practise their oral skills in a real Community of Practice (CoP) with members of a different gender, level, life experiences, hobbies, etc. (González-Lloret, 2020). Moreover, a learner-centered activity is rooted in constructivist learning theory, which aims to enhance learning by involving learners in a dynamic environment that helps them to make associations of what they learn with the real world (Lan, 2020). Collaboration in a task, for example, is a learner-centered activity (Gonzalez Lloret, 2020; Jauregi Ondarra et al., 2022b). The VR-mediated tasks in Immerse initially seemed to be more teacher-centered since the instructor highlighted the grammatical focus (as mentioned above) at the beginning of the lesson. Gradually, though, she allowed the participants to think and work together on their dialogues, intervening only, when necessary, thus acquiring the role of a facilitator. She consistently endeavored to demonstrate to the participants how to effectively utilize the affordances of the immersive environment to foster more collaboration between them. Participants learnt how to give each other the "thumbs-up" when a correct answer was given. Moreover, they clapped to show their encouragement or to reward their fellow students, and they also engaged in guessing games.

The affordances of the immersive environment also enabled participants to work together in tasks. In task 4, for instance, through the sense of touch (haptics), participants explored the rich elements of the environment and picked up objects to mime out various activities and have their peers guess what they were going to do through Q&A while simultaneously using the target language. It is also important to mention that, apart from their linguistic needs, the participants had the opportunity to practise their digital literacy skills in low-immersion VR (using a mouse, a keyboard, and a monitor) and high-immersion VR (using a VR headset) (Dhimolea et al., 2021) while carrying out the tasks. These digital literacy skills evolved over time as participants became more proficient in navigating Immerse. Initially, significant time was spent on teaching participants how to use controls and manage technical issues such as using various tools in their virtual backpacks, but as the weeks progressed, participants'

confidence and ability to interact with the digital environment improved markedly, improving their overall learning experience.

Principle 4, "*holism*", refers to the complex notions of "authenticity" and "real-world relationship" with language use, acknowledging the interconnected relationship of learner interaction with the tasks, the goals of the tasks, the outcomes, etc. (Gonzalez-Lloret & Ortega, 2014) as opposed to language instruction in formal environments. Many elements were conducive to the realization of the oral interactions. First and foremost, the plethora of VR environments in Immerse gave the participants the opportunity to simulate many experiences they would have in real-life, allowing them also to negotiate feelings such as enthusiasm (i.e. playing darts, entering a pool, etc.), curiosity (i.e. trying to figure out the word for *burrito*), portrayal of their personal taste (i.e. adding bacon in their burger), support (i.e. giving the thumbs-up to a fellow student for identifying the correct food on the food counter), etc. Moreover, it is important to stress how the sensory-rich environments in Immerse allowed participants to remain engaged, even during moments when they were not directly interacting with the lesson (i.e. through the navigation and perception of space, hearing the sounds of objects, trying to manipulate objects, etc.).
*"Reflective learning"* (Principle 5) focuses on the learning processes, and not on the learning content (Nunan, 2004). In contrast to most VR research studies that have relied on single interventions, the eight VR-mediated tasks in this paper come from a case study on learning processes in the metaverse (Thrasher et al., 2024) conducted over an 8-week period. This extended exposure to tasks allowed participants to gradually progress their linguistic productivity, advance their familiarity with low-immersion and high-immersion VR technologies (i.e. handling objects or placing objects in their backpack became gradually easier) and grow their intercultural awareness (i.e. teleport to Hamburg, Germany to look at the TV Tower, find information about Rantau mountain in Malaysia, etc.). Moreover, participants received a reflection email after each lesson, prompting them to consider what they learned, identify areas that needed further practice, and plan how to address those needs. When there was time at the end of lessons, the instructor also spent a few minutes asking participants reflection questions (e.g., "What did you learn today?") about their experience.

Even though the tasks presented in this paper adhere to the TMTBLT principles, some were less effective than others. For instance, task 6 *"Describing animals and their abilities"* was not particularly successful as it was predominantly grammar-oriented, and the topic also did not seem to align well with the interests of the adult learners. Talking about the abilities of animals (i.e. what a cheetah can or cannot do) did not capture the interest of the target group and the choice of the environment (the zoo) did not provide participants with ample opportunities to interact with elements. As a result, they were mostly confined to a specific area by the board, which limited their ability to navigate, touch objects, and engage with the virtual surroundings like in other tasks. Moreover, in earlier lessons, some of the actions students were asked to perform in the virtual environment were too difficult and disrupted the flow of the lesson. For example, in week 2, students were asked to put objects from around the home in their virtual backpacks which proved to be technologically challenging and time-consuming.

## 4. Conclusions

This paper aims to provide language practitioners with theoretical insights on the pedagogical integration of VR in TMTBLT and on how certain VR affordances can be harnessed to enhance collaborative tasks in immersive spaces. Both the successful and unsuccessful aspects of tasks were examined to see how the TMTBLT principles align with VR-mediated tasks. Given the affordances of VR environments such as simulation of authentic contexts, a sense of presence, embodied learning opportunities, as well as the 'experiential' nature of TBLT through 'learning by doing', we can create a synergy between the implementation of VR as digital tool and the pedagogical application of TBLT in immersive spaces for language learning education.

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# Artificial intelligence in CALL

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# A semi-systematic review of research on generative artificial intelligence (GenAI) in second-language acquisition (SLA)

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***Abstract***

*The release of ChatGPT in November 2022 led to a surge in research in Artificial Intelligence in Education (AIED), revealing new opportunities in education. In language learning, generative text models offer valuable affordances, such as supporting writing and reading comprehension. However, concerns related to academic integrity remain. As we approach the two-year milestone since the release of ChatGPT, the scientific community is immersed in an influx of publications in this rapidly evolving field. This necessitates an examination of the early state of research regarding the pedagogical implementation of GenAI in language learning. The semi-systematic review presented in this paper analyzes 12 primary studies of GenAI in language learning. The aim is to unveil overarching trends in the early research related to (1) participant and study characteristics and (2) key research themes. The results of this semi-systematic review revealed distinct trends. Two primary themes emerged: investigating learning and assessment Affordances and examining learner and teacher Perceptions. The implications of this semi-systematic review for future research will also be explored. Thus, this review provides valuable insights into the current state of research regarding GenAI's role in language learning, paving the way for future investigations.*

***Keywords:*** *semi-systematic review; generative artificial intelligence; language learning.*

## 1. Introduction

The release of ChatGPT in November 2022 has sparked substantial interest within the scientific community. This is attributed to the tool being the first chatbot to offer such generative capabilities via a free, user-friendly interface accessible to the public (van Dis et al., 2023). Generative artificial intelligence (GenAI) has had major repercussions in all spheres of society, notably in the field of education. The new perspectives and opportunities in education unveiled by this innovative technology can be ascribed to researchers recognizing GenAI as one of the most revolutionary advancements of our era (Han, 2024)

GenAI refers to computer systems that use machine learning models, particularly deep learning, to autonomously produce new content (e.g., text, image, sound) after being trained on large and diverse sets of data (Feuerriegel et al., 2024). ChatGPT, Gemini, Midjourney, and Dall-E are example of GenAI systems. Specifically, ChatGPT, a system based on the GPT generative text model, is defined as an "AI-enabled chatbot that can generate outputs

 

responding to varied and complex prompts (e.g., languages, instructions, questions) and engage in sustained human-like interactions" (Javier & Moorhouse, 2023, p. 1).

GenAI offers valuable language-learning affordances for enhancing pedagogical approaches in language learning (Warschauer & Xu, 2024). For example, generative text models allow learners to practice writing through unlimited, authentic interactions with a tireless language-learning assistant that can provide feedback (Kohnke et al., 2023). GenAI also benefits teachers, such as by offering feedback on learners' written work (Rudolph et al., 2023). However, using GenAI raises ethical and pedagogical concerns, particularly regarding academic integrity (Javier & Moorhouse, 2023). Over-reliance on GenAI may hinder learners' creativity and critical thinking (Godwin-Jones, 2024). Human expertise remains necessary to ensure a critical and nuanced understanding when using GenAI (Warschauer & Xu, 2024). Thus, the integration of GenAI in language learning presents both opportunities and challenges.

Since the launch of ChatGPT, there has been a notable increase in published works exploring GenAI in education across various subjects. This highlights the necessity to examine the current state of research concerning the pedagogical integration of GenAI in language learning. A semi-systematic review was completed to uncover overarching trends in research and serve as a valuable reference for researchers in the field. Specifically, the project was guided by the following research questions: (1) What are the participant and study characteristics in primary studies on GenAI in language learning? and (2) What are the main research themes explored in primary studies on GenAI in language learning?

## 2. Method

### 2.1 Research design

This semi-systematic review reports on the early literature on research into the pedagogical integration of GenAI in language learning. According to Snyder (2019), semi-systematic reviews provide a general overview by detecting patterns in a field of research (i.e., research questions 1 and 2) and highlighting themes in the literature (i.e., research question 2). Moreover, in Lo's (2023) rapid review of GenAI in education, the author recommends the use of a rapid or semi-systematic review as opposed to a lengthier process to allow researchers to catch up with the literature. Therefore, this approach was adopted considering the rapid development of research in the field.

### 2.2 Search strategy

The search was conducted between September 20 and October 27, 2023. Three databases were used as part of this literature search: SCOPUS, ERIC (including Education Source, Academic Search Complete, and Computers & Applied Science Complete), and Linguistics Database (LLBA). The following search string was inputted into the databases: ((“ai-powered” W/1 (chatbot* OR technology)) OR (generative W/1 (ai OR “artificial intelligence” OR “pre-trained transformer” OR “pretrained transformer” OR “ai-enabled chatbot*”)) OR ((large OR ai) W/1 “language model*”) OR “machine-learning system” OR “intelligent chatbot*” OR chatgpt) AND (“second language acquisition” OR ((“second language*” OR “foreign language*” OR “additional language*” OR L2) W/1 (teach* OR learn* OR acqui*))). The SCOPUS nomenclature is used here to exemplify the search string, but other proximity operators were used based on the database (e.g., Nn in ERIC, N/n in LLBA).

The studies that met the following inclusion criteria were selected for the review: (1) employs GenAI text models (e.g., ChatGPT), (2) implements GenAI systems in language learning, (3) reports primary research, (4) be published as journal articles or chapters in edited books, (5) is written in English, and (6) is published after November 2022 (ChatGPT release date). The initial search yielded 293 publications. After removing the duplicates and publications that did not meet the inclusion criteria based on the titles and abstracts, 47 studies remained. After reading the documents, a total of 12 articles were included in the semi-systematic review. The reduction from 47 to 12 studies was primarily due to many papers not meeting the third inclusion criterion of reporting primary research, as the early literature on GenAI in language learning largely consists of SWOT analyses (Strengths,

 

Weaknesses, Opportunities, Threats) rather than empirical studies. The corpus of 12 primary studies used in this review are marked with an asterisk (*) in the references.

### 2.3 Data analysis

Data charting was the method used to extract data from the corpus and compile a summary of key information (Peters et al., 2020). First, the charting table was created with the relevant variables, subsumed into four categories: bibliometrics, participant and study characteristics, and research themes. Then, a first round of data charting was completed, which led to a refinement of the charting table: variables were removed, added, merged, or rephrased if necessary. Finally, a second round of data charting was completed.

Data was analyzed using descriptive quantitative frequency distribution (research questions 1 and 2) and descriptive qualitative content analysis (research question 2) following Creswell and Poth's guidelines (2018). For the second research question, frequency distribution was carried out after content analysis. Content analysis involved coding research themes into categories. Three levels of themes were employed in the coding process. Level 1 categorization followed the operationalization of Cardoso's (2022) chronological stages of research on computer-assisted language learning: (1) development of a tool (*Development*), (2) exploration of the tool's affordances (*Affordances*), (3) assessment of the suitability of the tool (*Perceptions*), and (4) assessment of the pedagogical effectiveness of the tool (*Outcomes*). Levels 2 and 3 offered more details about the themes.

## 3. Results

### 3.1. Participant and study characteristics

To answer the first research question, the following variables were charted: participant type, number of participants, target language, educational setting, and geographical location. See Table 1 for an overview of participant and study characteristics. Results for participant type and number of participants pertain to the studies in which data was collected from human participants ($n$ = 10).

Two types of participants were involved, namely students ($n$ = 5) and teachers ($n$ = 6). The distribution indicates a somewhat equal research focus for both participant types. One study involved both types of participants (Algaraady & Mahyoob, 2023). Other educational stakeholders (e.g., administrative staff) were not involved in the corpus. The number of participants varied between one and 110 ($M$ = 25.3). Student and teacher participants from Algaraady and Mahyoob's (2023) study were subsumed to calculate the mean. Overall, except for Özdemir-Çagatay's (2003) study which involved 110 participants, the remaining studies had 40 of fewer participants.

English was the only target language in the corpus ($n$ = 12). In terms of educational setting, research almost exclusively explored GenAI systems in a university context. One exception, Özdemir-Çagatay (2023), compared two educational settings, university and K-12 (i.e., kindergarten to grade 12).

The primary geographical continent in which the studies took place was Asia ($n$ = 9). The specific locations in Asia varied widely, encompassing China ($n$ = 3), Cyprus ($n$ = 1), Hong Kong ($n$ = 1), Japan ($n$ = 1), Saudi Arabia ($n$ = 1), Thailand ($n$ = 1), and Turkey ($n$ = 1). Moreover, one study took place in Norway, Europe (Shaikh et al., 2023) and another one used data from language testing centers around the world (Mizumoto & Eguchi, 2023). Overall, China ($n$ = 3) was the most common location.

**Table 1**. Study and participant characteristics.

| Publication | Participant type | Number of participants | Target language | Educational setting | Geographical location |
|---|---|---|---|---|---|
| Alexander et al. (2023) | teachers | 6 | English | university | Cyprus |

| | | | | | |
|---|---|---|---|---|---|
| Algaraady and Mahyoob (2023) | students, teachers | 34, 1 | English | university | unspecified |
| Kohnke et al. (2023) | teachers | 12 | English | university | Hong Kong |
| Mizumoto and Eguchi (2023) | n/a | n/a | English | language testing center | worldwide |
| Mohamed (2023) | teachers | 10 | English | university | Saudi Arabia |
| Özdemir-Çagatay (2023) | teachers | 110 | English | university, K-12 | Turkey |
| Shaikh et al. (2023) | students | 10 | English | university | Norway |
| Ulla et al. (2023) | teachers | 17 | English | university | Thailand |
| Xiao and Zhi (2023) | students | 5 | English | university | China |
| Yan (2023) | students | 8 | English | university | China |
| Young and Shishido (2023) | n/a | n/a | English | university | Japan |
| Zhou et al. (2023) | students | 40 | English | university | China |

### 3.2. Research themes

To answer the second research question, the object of research of the studies was classified into the three levels of themes. The Level 1 classification was informed by Cardoso's (2022) framework: *Affordances*, *Perceptions*, and *Outcomes*. Overall, research focused on *Affordances* (*n* = 6) and *Perceptions* (*n* = 7). Yan (2023) is the only study that focused on more than one theme. In fact, their project pertained to both *Affordances* and *Perceptions*. See Table 2 for the summary of research themes.

#### *2.3.1 Levels 2 and 3 themes: Affordances*

The classification of Level 2 themes offered a second degree of precision about the context in which the affordances were explored. Overall, research on GenAI *Affordances* focusses on two contexts: learning (*n* = 2) and assessment (*n* = 4). Level 3 themes, the classification of the precise object of research, reveals that learning *Affordances* were examined from two angles. Yan (2023) explores the affordances of GenAI in the writing process. Young and Shishido (2023) examine the potential of AI-generated dialogues as learning materials.

Level 3 classification reveals that assessment *Affordances* were examined from two main perspectives. The first is an interest in the comparison between human-generated texts and AI-generated ones (*n* = 2). The goal of this research is two-fold: to assess the capacities of AI to generate texts and to identify the linguistic features that could help the detection of AI-generated texts. The second research angle is the exploration of GenAI in the correction process (*n* = 2). Specifically, Algaraady and Mahyoob (2023) explore GenAI's potential to provide feedback and Mizumoto and Eguchi (2023) focus on the capacity of the technology to correct written work.

 

### 2.3.2 Levels 2 and 3 themes: Perceptions

Level 2 classifications reveals that perceptions were gathered from two educational stakeholders: students ($n$ = 3) and teachers ($n$ = 4). Overall, the object of research sought to gather general perceptions of GenAI as a learning tool by students ($n$ = 2) and teachers ($n$ = 3).

Additionally, one study measured students' perceptions of the usefulness and effectiveness of the pedagogical use of GenAI via two existing frameworks: the system Usability Scale (SUS) and the Usefulness, Satisfaction, and Ease of Use (USE) questionnaires (Shaikh et al., 2023). Kohnke et al. (2023) explored teachers' perceptions of the requirements that are essential to implement GenAI in an educational contexts, such as digital competency and pedagogical knowledge.

**Table 2**. Research themes.

| Publication | Level 1 theme | Level 2 theme | Level 3 theme |
|---|---|---|---|
| Alexander et al. | affordances | assessment | AI-generated text detection |
| Algaraady and Mahyoob | affordances | assessment | AI-generated feedback |
| Kohnke et al. | perceptions | teachers | GenAI adoption requirements |
| Mizumoto and Eguchi | affordances | assessment | AI-generated essay scoring |
| Mohamed | perceptions | teachers | GenAI as a language-learning tool |
| Özdemir-Çagatay | perceptions | teachers | GenAI as a language-learning tool |
| Shaikh et al. | perceptions | students | usefulness and effectiveness of GenAI |
| Ulla et al. | perceptions | teachers | GenAI as a language-learning tool |
| Xiao and Zhi | perceptions | students | GenAI as a language-learning tool |
| Yan | affordances, perceptions | learning, students | writing process, GenAI as a language-learning tool for writing |
| Young and Shishido | affordances | learning | AI-generated learning materials |
| Zhou et al. | affordances | assessment | comparison between human-generated and AI-generated texts |

## 4. Discussion

This semi-systematic review set out to examine the early state of research of the pedagogical implementation of GenAI in language learning. Specifically, the project focuses on two components within each publication: participant and study characteristics as well as research themes. Since the search was conducted between September 20 and October 27, 2023, this project is a review of the early literature available since the new wave of research on AI propelled by the launch of ChatGPT in November 2022.

 

### 4.1. Participant and study characteristics

One key finding is that English is the only target language in the corpus. This can be associated with the fact that research in language learning, such as CALL, tends to focus on English learning contexts (Gillespie, 2020). This has significant implcations in research on the use of GenAI because while the tools are trained on various languages, the largest training datasets are in English (Rudolph et al., 2023). Accordingly, we can wonder if the same pedagogical affordances would apply to a context in which the target language was different from English. For example, if a learner's first language is underrepresented in GenAI datasets, they may be unable to interact with GenAI systems. These learners might need to achieve a certain proficiency threshold in the target language before they can effectively integrate GenAI into their learning process. The literature has highlighted this potential requirement for learners to attain a certain level of target language proficiency to benefit from GenAI in language learning (Godwin-Jones, 2024; Han, 2024). This underscores the need for future research to explore the affordances of AI systems with varying first languages, target languages, and learners with varying proficiency levels in the target language.

Moreover, research mostly takes place in a university context, likely due to easier access to participants (Gillespie, 2020). However, this narrow focus overlooks a critical ethical concern: the digital divide. Godwin-Jones (2024) highlights that access to technological tools, including GenAI, can be limited in certain parts of the world due to factors such as socioeconomic disparities. The powerful capabilities of GenAI may further exacerbate this divide, potentially entrenching educational inequalities. Therefore, it is crucial to expand research to diverse educational contexts and socioeconomic settings to gain a more comprehensive understanding of the impact of GenAI on language learning and to address the consequences of the potential disparities in access.

### 4.2. Research themes

CALL research appears to follow a cyclical pattern, delineated in Cardoso's (2022) chronological framework, where the release of technology (stage 1: *Development*) prompts scholars to first explore the tool's overall potential for pedagogical integration (stage 2: *Affordances*) and users' perceptions of the technology (stage 3: *Perceptions*). As more research on stages 2 and 3 becomes available, scholars then tend to begin adopting research designs that employ more specific instruments and experiments to focus a specific phenomenon uncovered in the early literature and examine the pedagogical effectiveness of the tool (stage 4: *Outcomes*). The cycle then repeats itself when new technology or new functionalities within a technology is released.

Such cyclical process has been activated with GenAI, where the onset of this new wave of research on AI can be attributed to the release of ChatGPT. This stands in contrast to earlier AI technology that was more limited to, for example, computer experts (Warschauer & Xu, 2024). As outlined in this review, early research has tended to focus on stages 2 and 3 of the framework, prompting Han (2024) to call researchers to "engage in serious empirical inquiries into its functionalities and how learners and instructors use them as apart of second language learning processes and outcomes" (p. 5). Thus, the findings of the studies reported in this review may influence the research objects of the literature to appear in the next few years.

#### *4.2.1. Levels 2 and 3 themes*

There seems to be a focus in research on *Affordances* related to assessment, reflecting the critical concern surrounding academic integrity in educational settings (Javier & Moorhouse, 2023). This review reveals a concerted effort to explore the potential threats to academic integrity posed by the pedagogical use of GenAI, highlighting the need to establish frameworks for AI literacy that empower learners to "understand, access, prompt, corroborate, and incorporate generative AI and the content it produces" (Warschauer & Xu, 2024, p. 2). By developing those frameworks, informed by insights from early literature, educators can equip students with the necessary skills to navigate the complexities of GenAI while maintaining ethical academic practices.

The current body of research predominantly focuses on broad perceptions of GenAI as a learning tool by learners and teachers, with most studies adopting an exploratory approach rather than a descriptive one. This trend reflects

 

the early stage of GenAI research in education, where general perceptions are typically examined before delving into specific phenomena. However, as the field matures, there is a pressing need for more targeted and standardized research methodologies. Future work should prioritize the use of standardized, validated tools to enhance the rigour and generalizability of findings. For instance, the Unified Theory of Acceptance and Use of Technology (UTAUT, Venkatesh et al., 2012) offers a standardized instrument for measuring variables that predict technology usage behaviour. Adopting such established frameworks could significantly advance our understanding of its impact and adoption over time.

## 5. Conclusions

In conclusion, this semi-systematic review sheds light on the early research into the pedagogical implementation of GenAI in language. The recent and rapid developments in AI technology create a multitude of research avenues. This review highlighted key areas, including learning and assessment affordances of GenAI as well as teacher and student perceptions of the use of the technology in a learning context.

This review has uncovered methodological limitations that should be recognized. While a semi-systematic approach allows to quickly gain insight about the state of research in a field (Snyder, 2019), the fast nature of the process has limitations. This approach enables researchers to select studies slightly more arbitrarily than via a systematic approach. This allows the search process to be expedited. Indeed, the timeline for the search of studies was short, just over one month, between September 20 and October 27, 2023. The short search also indicates that important works may be missed. Thus, it is essential to consider this semi-systematic review as an overview of the field to identify broad patterns rather than an attempt to provide a systematic review. As the technology continues to evolve and further research examines the impacts of GenAI in language learning, scholars will gain a deeper and more holistic understanding of the unprecedented pedagogical opportunities that the technology makes possible. It would be essential for researchers to repeat this activity using a systematic approach when a wider body of research is available.

## References

The 12 primary studies used in the review are marked with an asterisk (*).

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# AI-powered tools in English pronunciation classroom: An action research report

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***Abstract***

*The constant development of computer-assisted language learning (CALL) has been recently enriched by implementing artificial intelligence (AI) technology. The ability of the AI to process the learner's input and interactively move it forward towards accomplishing a communicative goal distinguishes it from automatic speech recognition (ASR) used thus far. In this way, AI-powered tools help develop learners' foreign language proficiency across all language layers, including pronunciation. The presented study aims to report recent experiences implementing AI-powered tools in a pronunciation classroom EFL context gained through action research. The study participants were first-year English students who were asked to explore the potential of AI-powered tools in improving their pronunciation through tasks imitating real-life communication and accuracy-aimed tasks. At the end, the participants were invited to complete a questionnaire focusing on their perceptions and experience with the tools. Their answers provide insight into their attitudes and allow for formulating recommendations for their implementation in English pronunciation classrooms. In particular, the less proficient participants appreciated conversation with a chatbot because it allowed them to practice communication in different scenarios. On the other hand, more advanced participants preferred tools providing explicit and guided feedback.*

***Keywords:*** *AI-powered tools; pronunciation; English; pronunciation training; CALL; EFL.*

## 1. Introduction

Pronunciation training has historically relied on technology, predominantly using various tools and programs that provide a model for EFL learners, promoting independent practice. Within the umbrella term computer-assisted language learning (CALL), computer-assisted pronunciation training (CAPT) encompasses a diverse group of tools that address the needs of most learners both in and out of the classroom (Golonka et al., 2014; Rogerson-Revell, 2021). Recent research has explored and confirmed the growing use of AI in language classrooms (Park & Doo, 2024; Pokrivcakova, 2019; Wang et al., 2024), particularly in enhancing pronunciation and overall oral competence. AI-powered tools typically include mobile apps, chatbots, virtual assistants, and AI-based modules within more complex learning programs or applications (Vančová, 2023). These tools have proven to be comparable in quality to human communicators and are being considered for implementation in the academic sphere as official evaluation tools (Isbell et al., 2024).

AI-powered tools significantly contribute to improving pronunciation accuracy, increasing motivation, and reducing speaking anxiety (Vančová, 2023). Notably, EFL and ESL learners using AI-based applications have shown greater improvements in pronunciation compared to those using traditional training methods (Mohammadkarimi, 2024; Shafiee Rad & Roohani, 2024). While learners generally express positive attitudes

 

towards AI-based pronunciation tools, challenges such as addressing individual pronunciation differences must be acknowledged (Mohammadkarimi, 2024). Overall, AI shows great potential for enhancing pronunciation training in both formal and informal learning settings (Vančová, 2023). Teachers must reflect on the latest technological advancements used in the classroom to better manage various aspects of teaching and organization, providing tailored feedback to all learners and creating uniquely designed input with a high level of individualization and automation.

Automatic Speech Recognition (ASR) technology plays a crucial role in providing feedback and evaluating learner performance (Vančová, 2021) by statistically analyzing pronunciation deviations and comparing the speaker's performance to a model integrated into the system. However, AI goes beyond acoustic analysis by simulating human-like responses to vocal input based on typical human behavior (Shafiee Rad & Roohani, 2024). Therefore, AI-powered tools can demonstrate the communicative value of pronunciation to EFL learners rather than merely providing drilling and imitation exercises.

AI-based tools offer significant advantages to learners by not only statistically evaluating input but also tailoring the adaptive nature of the output to the speaker, allowing them to implicitly receive feedback that mimics real-life communication. In a systematic review of AI-powered tools for pronunciation practice, Vančová (2023) concluded that different tools can be used for different learners, one-fits-all learners tool currently does not exist. Both off-the-shelf and specifically designed tools are employed for intentional or non-intentional pronunciation training. Many freely available learning apps integrate AI-powered features, enabling chatbots and virtual assistants to communicate with language learners in all environments and promote ubiquitous learning. Tailor-made tools can fine-tune specific pronunciation features for university students, while freely available tools help workers in tourism enhance their pronunciation to achieve specific communication goals.

In the classroom context, despite its limitations, AI offers a wide range of opportunities to improve teaching practices, carry out administrative tasks, and optimize workload, classroom management, and assessment (Ahmad et al., 2022; Celik et al., 2022; Lameras & Arnab, 2022; Mollick & Mollick, 2023). However, AI will likely not fully replace human teachers in the near future (Chan & Tsi, 2023).

In pronunciation training, EFL learners must address various pronunciation mistakes, including phonetic, phonemic, allophonic, and distributional errors (Moulton, 1962; Vančová, 2016) at both segmental and suprasegmental levels. Typical pronunciation training activities are based on sound imitation and sound discrimination (Couper, 2021; Pennington, 2021). The pronunciation goals can be defined in terms of accuracy, intelligibility and comprehensibility (Kennedy & Trofimovich, 2008; Thomson, 2017).

Based on the features of AI-powered tools for pronunciation practice, this study aims to answer the question: *How can teachers benefit from using AI-powered tools in the English pronunciation classroom to enhance their teaching practice?*

## 2. Method

### 2.1. Context and participants

Teachers who completed their formal education often face challenges in their own classrooms once they start teaching. The problems may be unique to each teacher's situation and conditions. Therefore, teachers need to improve their own teaching practices by educating themselves and implementing new techniques into their teaching. In action research as a research method, the teacher becomes a researcher and can solve the challenges by reflecting on their own actions and practices while teaching (Vančová, 2021). The typical steps in action research include identification and observation of classroom practices, investigation of the potential techniques they apply in teaching, practical implementation of new techniques in the classroom, evaluation of the achieved results and reflection on the teaching experience (for reference, see Nazari, 2022; Tobin et al., 2024).

The presented action research was conducted within a practical English phonetics course. This course primarily focuses on contextualizing information about the specifics of the English pronunciation system while also offering

 

opportunities to practice the articulation of theoretically described features in spoken texts. Over the years, the course techniques related to pronunciation practice have evolved. Initially, learners modeled their pronunciation on audio recordings using the traditional listen-and-repeat technique, with feedback provided individually through written comments by the teacher. Due to the range of pronunciation deviations from the model and the teacher's limited time, only the target sounds of the lesson were addressed in the feedback. In subsequent years, students benefited from ASR technology, which automatically indicated the specific pronunciation of individual speakers. Recently, with the availability of AI-based technology for educational purposes, there has been an opportunity to explore its potential to improve teaching practices.

The participants in this action research were two groups of first-year students of English language teaching and English language and culture (N=39). In the previous semester, they attended a course on English language phonetics and phonology, which included a module on practical pronunciation training.

### 2.2. The AI-powered pronunciation practice instruments observed

Action research aims to identify areas where the teacher-researcher can improve their teaching practices. Consequently, this study will focus on potential teaching improvements based on the type of tool and the suggestions of study participants, rather than evaluating the quality of a specific instrument. The three research tools will remain unnamed, but their nature will be described for context. All three observed tools are freely available online and were related to the pronunciation focus of the lesson.

Tool A was designed as a chatbot. Its interface allows users to choose an accent and a scenario to explore. Users speak into a microphone, and the chatbot holds a conversation with them. Participants were asked to complete at least three scenarios, each lasting a minimum of five minutes.

Tool B allowed learners to type in sentences they wanted to practice and drill. The program analyzed spoken answers on various language layers, including pronunciation. Alternatively, the software could generate sentences for speakers to practice and provide alternative training options.

Tool C involved asking users simple questions. After each recording, users received feedback regarding their accuracy on language levels or exam scores. Users could choose their practice targets, such as exam preparation or job interviews.

### 2.3. Data collection and analysis

Throughout the action research, students worked individually at home within the blended course. This work involved the practical implementation of pronunciation issues discussed in the in-class seminar and the pronunciation training exercises. The research encompassed three lessons, each incorporating an AI-powered tool for pronunciation practice. After each lesson, students completed a questionnaire with open-ended questions to analyze their attitudes and experiences with the instruments. This action research will present their reflections and recommendations from the perspective of teaching practices. Students were informed of the anonymous and voluntary nature of the questionnaires. The number of collected responses varied for different tools: 30 for Tool A, 24 for Tool B, and 15 for Tool C. After collecting all digital responses, they were downloaded and ordered according to the order of their submission. Each participant (hereinafter referred to as P) received a number that labeled their responses across all tools observed. All responses were read and analyzed for their content in terms of the topics they addressed. Then, codes were developed according to the topics the study focused on and the participants addressed (i.e., perceived ease of use, perceived accuracy of the tool, and engagement of the learners while using the tools).

 

# 3. Results

## 3.1. Tool A

The first observed tool was a chatbot with various scenarios and role-plays. For some students, this was the first experience with the chatbot *("It was something new for me, I have never tried to make a conversation with Al before. I don't see any minuses only great opportunity for improving speaking and reading skills*," participant 1; "*I have never done anything like that before,"* P6). The students mostly appreciated the opportunity to practice their speaking skills ("*a good language practice, engaging with the speaker than automatically they get feedback*," P8). Other recognized positives was the engaging and useful nature of the tool in improving speaking skills *("I found it useful to have different scenarios to choose from and the AI responses were helpful in keeping the conversation going*," P12). Due to the adaptability of AI-powered tools, the conversation skills of students also improved *("I improved my creative thinking in terms of creating new topics to talk about,"* P16; "*the questions AI asked were relevant to the real world, which I find very useful and I will definitely use it again to improve my speaking skills,"* P21*; "I can imagine a person can improve not only with language but also with social interactions,"* P15). In addition, learners can use the chatbot for preparation of real-life conversations *("it could be useful for practicing before going to an English-speaking country as the scenario I tried would be a common thing on a vacation/trip,"* P27). In particular, students improved pronunciation of specific words, such as *sourdough bread, dietary, aligns* (P8), *psychology* (P7) or general speaking fluency (P3, P12, P28, P34).

The participants would suggest using the tool for younger or beginner learners *("I think it would be very good for younger students as I we are already able to deal with most of these situations pretty easily… throughout our studies we have had roleplays with several of the same topic that are available with the AI,"* P27).

However, the participants could also see the artificial nature of the conversation *("I don't think we can compare a bot chatting with a real-life communication, where the person has feelings and opinions. Chatting/talking with a bot seems very strange and unnatural to me,"* P28; *"It was a bit strange to have a human-like conversation with an AI. The tool contradicted itself a lot. Some it misheard a word I said and the conversation seemed to be going in circles,"* P5; *"I want to talk to a person not an AI,"* P17). The participants also reported minor technical problems related to the quality of the technical equipment available to them or acoustic conditions.

From a pedagogical perspective, a scenario-based chatbot appears to be a useful tool for students who are open to using technology in language learning but have limited opportunities to speak in English. This tool can also be beneficial in the classroom context. The wide range of scenarios allows for exploring different topics across various proficiency levels. Learners can improve the pronunciation of particular words, as well as segmental and suprasegmental features, and appreciate the communicative value of pronunciation by observing how mispronunciation can divert the direction of a conversation within a context. The feedback collected from participants was predominantly neutral to positive, with no fully negative reactions toward the chatbot. However, future use should address the limitations of chatbots in pronunciation practice and provide more structured instructions from the teacher. This will enable students to test their pronunciation skills and overall speaking proficiency across different scenarios in a meaningful way.

## 3.2. Tool B

The second tool was accuracy focused and overall generated more critical responses by the participants due to the perceived sensitivity to pronunciation *("that program sometimes didn't recognize my pronunciation, especially didn't recognize such easy words like "hey" or "okay."* P2). Due to the use of the decontextualized practice of sentences and lack of implicit feedback, the participants did not recognize the mistakes they made ( "*When I tried to speak and correct myself multiple times it usually didn't even pick up what as wrong and still didn't like the way I said it. Even after trying for an hour, it was still the same. It didn't really tell what to fix in the word that had 0 points as well,"* P3). The lack of context in pronunciation practice was not engaging for all readers *("I disliked that the generated sentences were repeating – dull,"* P23; *"It gave same phrases. Or it just changed some words*

*in the sentence,"* P29). However, some participants could see this as an opportunity to independently explore their pronunciation ("*Also the accents percentage might have been wrong and I would improve it by adding more feature and deeper analysis of the speech and different variations of sentences,"* P5; *I've noticed how small changes in pronunciation can increase as well as decrease my English level and now I may have a better understanding of distinguishing features in American and Britain English,"* P21). To confirm this assumption, P9 finetuned pronunciation of selected words (*particularly, comfortable, nuclear*). However, the tool was predominantly appreciated by more proficient participants ("*I have proficiency C1 overall… I did the test without any preparation and I did it fast. I did not overthink the answers, I simply pretended I was speaking spontaneously to a native speaker,"* P18).

From a pedagogical perspective, this tool appears to be most suitable for drilling exercises. Due to its ability to adapt text to the learner's needs, any challenging sound can be finetuned using words selected for a particular learner. This feature was particularly appreciated by more proficient learners of English. However, applying this tool with younger or beginner learners may not encourage engagement and should only be used as a complementary, rather than a primary, source of activities.

### 3.3. Tool C

The last tool combined features of the previous two tools. It gave students open answers to respond to and then adapted the subsequent questions to their responses. However, the scenario was not modeled for learners as a context. This has proven to be an advantage for some participants *("I would use it in future if I wanted to practice speaking skills on any given topic, since you do not know the question beforehand – advantage,"* P23; *"I improved my confidence and found out some of the new synonyms,"* P21) and disadvantage for other participants *("However, I disliked the limited vocabulary and topics available for practice, which did not cater to my specific interests,"* P12). The overall evaluation of the tool was positive for students with little confidence and the possibility to speak with human speakers ("*good questions, nice and effective tool for learning for someone who has no one to speak to,"* P23; *"The only challenge I encountered was with my pronunciation. However, this tool helped me improve my vocabulary and conversational skills. …I would use this tool in the future as it will help me enhance my speech and communicate freely on various topics,"* P24).

## 4. Discussion, conclusions and recommendations

Recent teaching practices have confirmed the growing use of AI in language classrooms (Pokrivcakova, 2019; Wang et al., 2024; Park & Doo, 2024). One of the primary applications of AI is enhancing EFL and ESL pronunciation. AI-powered tools, such as mobile apps, chatbots, virtual assistants, and AI-based modules, can be successfully implemented in teaching under specific conditions, including the meaningfulness of the tool (realistic scenarios), greater adaptability (sensitivity and responsiveness to the learner's input), reliability, and detailed feedback for learners requiring guidance (visual or verbal evaluation of the input; Vančová, 2023). A carefully selected tool can be an effective aid for language learners (Pokrivcakova, 2022, 2024), but it appears that these tools will not replace teachers anytime soon (Chan & Tsi, 2023), even though their benefits in various spheres of teaching and learning have been proven (Ahmad et al., 2022; Celik et al., 2022; Lameras & Arnab, 2022; Mollick & Mollick, 2023).

The action research focused on three different AI-powered pronunciation practice tools presented to university learners of English: a scenario-based chatbot, a drilling adaptive program, and an open-ended conversation with a chatbot. The participants' experiences, collected via questionnaire, revealed that these three tools can be used for various purposes for different groups of learners. The overall response to the tools was positive, although different tools generated varying levels of engagement. A comprehensive conclusion is provided in Table 1.

**Table 1**. Suggestions for recommended use of AI-powered tools in English pronunciation classrooms based on the classroom experience

 

| **Tool A** (scenario-based chatbot) | **Tool B** (adaptive pronunciation practice) | **Tool C** (adaptive pronunciation checker) |
|---|---|---|
| *Pedagogical advantages*<br>- Preferred by less proficient learners<br>- Substitution of human interaction in EFL settings<br>- Prepare learners for real-life experience<br>- Relatively new for learners | *Pedagogical advantages*<br>- Adaptive to learners' pronunciation training needs<br>- Addressing different goals (e.g. exams)<br>- Detailed feedback<br>- Preferred by most advanced learners | *Pedagogical advantages*<br>- Identification of learners' needs<br>- Adapting the practice content<br>- Detailed feedback |
| *Pedagogical disadvantages*<br>- No explicit feedback required by proficient speakers<br>- Limited number of scenarios<br>- Unnatural | *Pedagogical disadvantages*<br>- Not engaging enough for less proficient learners<br>- High demand for pronunciation accuracy | Pedagogical disadvantages<br>- Not engaging for less proficient learners |

The chatbot design appears to be the most engaging for learners; however, more proficient learners found it only slightly challenging compared to the drilling adaptive tool. The latter might not always provide immediate explicit feedback but allows learners to independently explore the peculiarities of their pronunciation. On the other hand, chatbots prepare learners for authentic communication better than drilling exercises. Overall, each tool can be implemented at different stages of language learning for specific purposes. Encouraging students to engage with AI-powered technology can significantly benefit their pronunciation accuracy, comprehensibility, and overall oral competence.

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# Bridging classrooms and technology: Supporting teaching practice with an LLM-powered ICALL system

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***Abstract***

*Recent years have witnessed the rapid advancement of Artificial Intelligence (AI) technologies, holding immense potential for revolutionising learning and teaching in the realm of Intelligent Computer-Assisted Language Learning (ICALL). However, most ICALL systems tend to prioritize learners' perspectives over those of teachers, whose involvement is crucial for integrating these systems in real-life school contexts. This oversight often results in teachers' reluctance to adopt and introduce these systems in daily teaching, thereby limiting their potential use in schools and reducing the ecological validity of research findings in actual language learning environments. This article aims to illustrate the ICALL system "ARES" to support teachers in their daily teaching practice with the power of a Large Language Model (LLM) with cooperating teachers' knowledge, enabling full integration into real-life school education. Aiming to foster the teachers' use of ICALL systems in real-life English as a Foreign/Second Language (EFL/ESL) settings, the design and development of the system have employed a cooperative approach with educators to optimize its responsiveness to user needs. In this article, we specifically present features designed to support teachers in their daily teaching practice and outline further evaluation of the system via questionnaires and log data.*

***Keywords:*** *Intelligent Computer-Assisted Language Learning (ICALL); Second Language Acquisition (SLA); teaching practice.*

## 1. Introduction

Classrooms today are more diverse than ever, with students representing a wide array of linguistic, cultural, and socioeconomic backgrounds. This diversity brings unique challenges and opportunities for educators, as highlighted by research emphasizing the need for individualized support (e.g., Dumont, 2019; Shemshack & Spector, 2020). AI applications in education (AIED), such as ICALL systems, present unique opportunities for innovative learning and teaching approaches (Amaral & Meurers, 2011). These systems have been shown to enhance learning engagement and achieve better language acquisition through features such as automatic feedback, intelligent tutoring, and personalized support (Ahmadi & Reza, 2018). Despite the advantages of such educational technology, the use of AI-powered educational products in schools and by teachers is still limited in many instances

 

(Tondeur et al., 2008). One possible reason is that such systems often focus solely on learner effectiveness, neglecting the practical needs of teachers, which leads to skepticism toward such products among educators (Chen et al., 2022). While teachers can implement technology integration practices, they also need to see how technology fits into their actual classroom and teaching practice (Cheng & Wang, 2023; Tondeur et al., 2008). This gap hinders teachers from utilizing these systems in classrooms with large student populations. Teachers are crucial for the successful integration of technological tools (Hedayati et al., 2018), and their use of these systems enables researchers to conduct interventions in ecologically valid settings, ensuring that findings are applicable to real-life language learning (Meurers et al., 2019). Thus, the successful implementation of educational technology, including ICALL systems, relies on teachers' perceptions of how they see clear benefits of such systems for their teaching practice (Akram et al., 2022; Motteram et al., 2013), which directly and indirectly impacts their classroom roles (Hedayati et al., 2018).

With the rapid advances of LLMs, much recent research has started to leverage the capabilities of these LLMs to support learners and teachers in various tasks (Kasneci et al., 2023). Given the potential of newly powerful LLMs in educational technologies, it is necessary to explore not only applications that align with the multifaceted demands of daily teaching practice such as content delivery, assessment, feedback, and individualized support for diverse student needs (Lan et al., 2024; Li et al., 2023) but also the way to incorporate teachers in the loop of such LLM-powered applications in daily teaching. In order to address the gap between foreign language teaching practice and the advantages of the technology, we have developed a pedagogically oriented LLM-powered ICALL system for reading in English, specifically targeting EFL/ESL contexts. While the primary goal is to enhance reading competence and motivation in second language (L2) English, the system is designed to integrate seamlessly with daily teaching practices in actual classrooms. The design and development have followed a collaborative approach with educators from the beginning to ensure the system is highly responsive to user needs. By incorporating an LLM, specifically ChatGPT 4o[1], the system allows teachers to perform various teaching tasks such as assignment creation and grading. We will demonstrate these features, designed to specifically support teachers in real classrooms, aiming to reduce their workload and facilitate personalized teaching practice.

## 2. Background

### 2.1. Teaching practice in ICALL systems

While many ICALL systems exist, most systems are research prototypes that are neither designed to align with the teaching practice of regular foreign language classes, focusing on a single aspect of teaching, nor tested widely in the classrooms (Amaral & Meurers, 2011; Choi, 2016; Quixal et al., 2021), offering limited functionalities to support teachers in their daily teaching. Based on the literature educational and SLA theories and iterative consultations with actual educators, here, we describe four particular functions that are considered to be effective for L2 reading instruction and teaching practice.

**Reading comprehension questions.** It is well known that deploying questions in teaching encourages students to self-explain, which has been shown to be highly beneficial for learning (Chi et al., 1994) by uncovering knowledge gaps in learners (Tenenberg & Murphy, 2005). Empirical evidence demonstrates the effectiveness of teacher questions as a scaffold for enhancing student text comprehension. (Blything et al., 2019). Especially, including higher level questions (e.g., inferential questions) promotes deeper processing and learning from text by activating relevant prior knowledge when compared with using only lower level questions (e.g., factual questions) (Blything et al., 2019). Therefore, using questions to direct attention to text content and scaffold understanding is a key element of effective L2 reading instruction, both in classroom settings (McKeown et al., 2009) and in computer-based learning environments (Graesser et al., 2005).

**Input enhancement.** While reading is considered an essential method for increasing the amount of rich language input received by L2 learners, at the same time, it is important to trigger language awareness on linguistic forms

[1] https://chatgpt.com/

 

and categories during such meaning-based activities to successfully acquire a L2 (Long & Robinson, 1998). One way to increase learners' selective attention to linguistic features is to provide input enhancement, which is a strategy that uses a range of visual cues such as highlighting or underlining to increase the saliency and noticing of the linguistic forms (Sharwood Smith, 1993). A series of empirical studies have demonstrated that input enhancement in general has been found to facilitate noticing and enhance learning (Ruiz et al., 2024), highlighting the importance of directing the learners' attention to forms in L2 reading practice.

**Feedback.** Feedback is information communicated to learners to modify their thinking or behaviors to close the gap between their actual performance and the target performance (Hattie & Timperley, 2007). The importance of feedback is well-documented in the field of SLA (Macky, 2006) and numerous studies have proven its effectiveness in improving learning (Shute, 2008) and enhancing emotions/motivation during (Fong, 2019). Among different types of feedback, elaborated feedback that includes extra-instructional information (Swart, 2022) such as hints of the correct information in the text has been especially shown to have positive effects compared to simply providing correct/incorrect feedback or the target answer (Van der Kleij et al., 2015; Wisniewski et al., 2020).

**Teacher dashboard.** Teachers regularly make decisions that lead to pedagogical actions based on their knowledge of both individual students and the classroom. This pedagogical knowledge includes understanding students' abilities, domain knowledge, common learning difficulties, and how specific errors indicate developmental challenges (Shulman, 1986). It also involves recognizing social dynamics and group-level progress in knowledge and skill development (Molenaar & Knoop-van Campen, 2017). A teacher dashboard could enhance this decision-making by providing information about students' progress (Knoop-van Campen et al., 2021). For instance, if many students are struggling with a particular skill, the dashboard could inform the teacher, allowing them to modify lesson plans accordingly. More broadly, dashboards can help teachers by making hidden patterns visible, enabling them to offer targeted support that goes beyond what educational systems can provide (Xhakaj et al., 2017).

Performing all these tasks, however, is both time-consuming and labor-intensive, particularly in classroom contexts where teachers often face constraints on time and resources. The recent development of LLMs offers a promising solution by automating various teaching tasks, potentially freeing up teachers' time and resources to focus on enhancing instructional quality (Law, 2024). In the following sections, we explore recent advances in LLMs and discuss how these models can be integrated with teachers' pedagogical knowledge to improve classroom practice.

### 2.2. The affordances and challenges of Large Language Models (LLMs)

LLMs generally function by leveraging extensive web corpus data and optimizing through reinforcement learning and human-AI interaction data (Liu et al., 2024). One of the most notable large language models is the Generative Pretrained Transformer (GPT) series, made publicly available as ChatGPT (Huang et al., 2023). This model has been shown to excel at a wide array of reasoning tasks including question-answering and assessment compared to previous LLMs (Nguyen et al., 2023). The release of ChatGPT has sparked a new wave of research exploring its optimal applications in language learning contexts as well (Bonner et al., 2023). Recent work has shown that it can act as a conversational partner that offers authentic natural conversations (Young & Shishido, 2023), or as a personal language tutor that pinpoints linguistic mistakes produced by L2 learners (Su et al., 2023) to improve learners' language proficiency. Simultaneously, concerns have arisen about potential cheating or plagiarism in writing assignments (Yang & Li, 2024), driven by how easily ChatGPT can produce human-like text in mere seconds. While much of the debate has centered on how students should or should not use ChatGPT, less focus has been given to how teachers and instructors might benefit from this cutting-edge technology (Nguyen et al., 2023). The increased productivity resulting from LLM utilization can alleviate stress among teachers, providing them with additional time and resources to enhance instructional quality (Law, 2024). Despite the promise these technologies hold, there remains a gap in applications designed to support teachers, emphasizing the need for a balanced approach that benefits both educators and learners in language education (Lan & Chen, 2024). This balanced approach can ensure that the full potential of LLMs is realized, leading to more effective and integrated

 

educational practices.

At the same time, it is important to note that LLMs still lack the same level of understanding and context awareness as humans (Bonner et al., 2023). Although they can perform a variety of tasks within seconds, LLMs struggle due to tendencies toward increased hallucination and subsequent performance issues from a lack of contextual awareness (Nye et al., 2023). For instance, in a study by Octavio et al. (2024) that investigates the potential of ChatGPT as a teaching support for EFL teachers, the authors found out that, while ChatGPT offers significant support to EFL teachers in planning and designing lessons, it is critical to incorporate teachers' teaching knowledge to be able to recognize inaccuracies of outputs by LLMs and identify relevant outcomes. Therefore, our work seeks to further explore the potential of the use of such LLM in an ICALL system to support teachers in their teaching in classrooms, as well as the way to incorporate teacher knowledge in such a LLM-powered system, combining the affordances of LLMs with teachers' expertise to create a more effective teaching environment. In the following section, we present the design of the system in detail.

## 3. Annotated Reading Enhancement System (ARES)

Building on the need for educational tools tailored to both teachers and students, *ARES (Annotated Reading Enhancement System)* is an LLM-powered ICALL system designed to enhance EFL/ESL students' reading comprehension. Importantly, by integrating the LLM (ChatGPT 4o) in the backend, ARES supports teachers by automating the processes of (1) question generation for assignments, (2) individualized feedback to student responses, and (3) scoring student submissions, significantly reducing their workload, while keeping them in the loop. Its design is based on iterative consultations with English teachers for the purpose of involving stakeholders in the system design and development process. While ARES provides interactive support to learners, here, we focus on illustrating features of the system that are specifically designed to support teachers in real classrooms.

### 3.1. Class and assignment management

The first function teachers encounter in the system is the class interface, where they can digitally create, delete, and edit classes and manage students, as shown in Figure 1. Here, teachers can assign a distinct class name and description. A 4-digit class code is automatically generated, allowing students to enroll in the class. Additionally, teachers can view and remove students enrolled in specific classes.

After creating a class, teachers can create assignments with instructions and a deadline and assign them to a specific class for students to work on individually. ARES provides automatically generated suggestions for two types of reading comprehension questions: factual and inferential questions. Teachers can select the number of each question type, and an LLM on the backend generates the requested number of questions. The generated questions are displayed on the frontend as suggestions, as shown in Figure 2. As noted in the Background section, in order to incorporate teacher knowledge in an LLM-powered system, we designed the system in a way that teachers hold the decision-making power based on the output by the LLM: they can post-edit the suggested questions by the LLM, confirm them, or manually add additional questions if needed.

In addition, teachers can select which input enhancement on grammar to present to students, allowing them to tailor assignments and annotations to meet specific learning objectives, as shown in Figure 2. The selected grammar constructions will be highlighted to students, which is also clickable to open a panel explaining the grammar in detail with examples. The rationale behind this customization is that reading texts often contain a broad range of grammatical structures, making it challenging for teachers to selectively direct students' attention on specific grammar constructs within the texts. By allowing teachers to customize grammar annotations based on learning objectives, the system ensures that reading materials highlight the target grammatical structures, thus making the learning process more efficient and aligned with pedagogical goals.

 

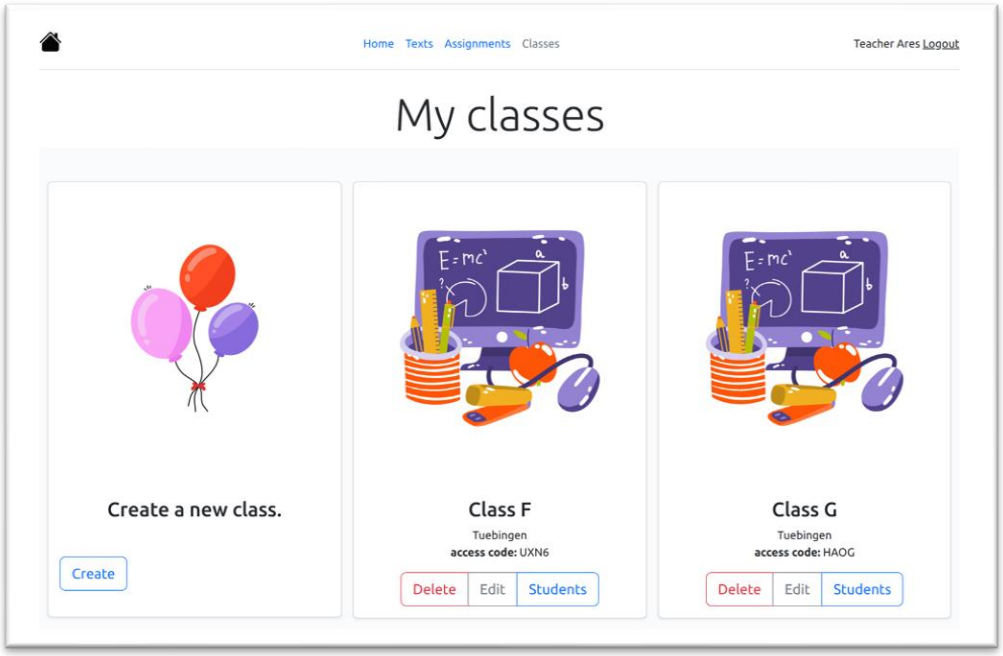


Figure 1. Teacher interface to manage classes and enrolled students

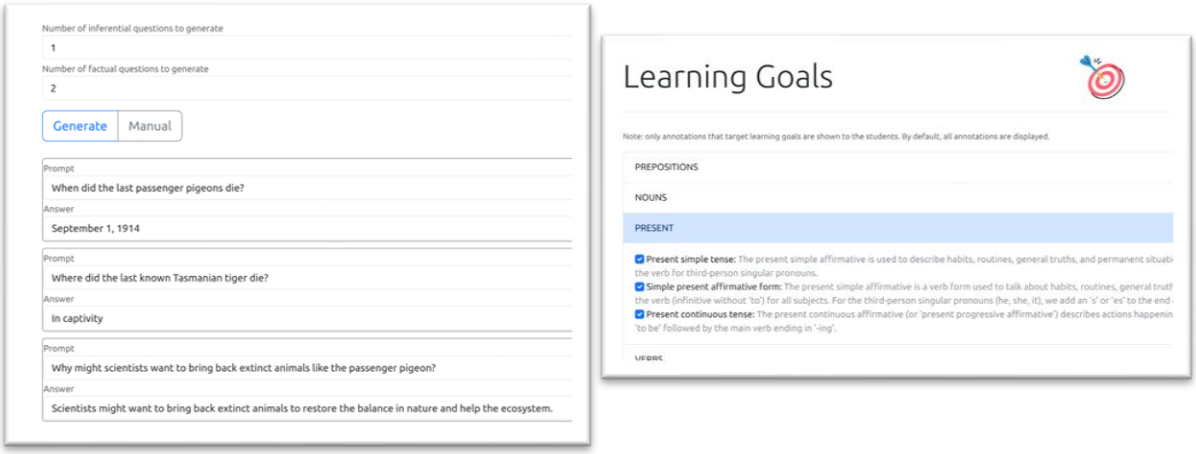


Figure 2. Reading question generation and in-context grammar support selection of the assignment creation

### 3.2. Feedback and grading

ARES automates feedback and grading process as well using an integrated LLM. Upon selecting the evaluation mode (Meaning only or Meaning and form), the “Grade all automatically” button in the grading interface shown in Figure 3 initiates the process, where all student responses are sent to the LLM in parallel. The LLM evaluates the student responses against target responses for each question, considering the reading text as context. As a result, teachers receive feedback suggestions for each response and a percentage score of correct responses as a grade based on the selected evaluation mode. Teachers can then confirm the feedback suggested by the system by clicking the “Accept all corrections” button. Again, to ensure that teachers remain in control, the system allows them to review and modify the automated scores by clicking the “Grade” button within the submission table, redirecting them to the individual submission page. Here, as shown in Figure 4, detailed evaluation information (questions, student responses, target answers, automatic scores, and feedback) of each submission is displayed, allowing teachers to adjust scores and feedback as needed. If the teacher agrees with the automated grading, they can use the “Copy all” button to transfer the automated scores and feedback to the manual grading section. Ultimately, students see only what teachers confirm at the end. This approach reduces teachers' grading burden

 

while ensuring teachers retain full control over what students see. After confirming the feedback and scoring, all the results are sent to each student.

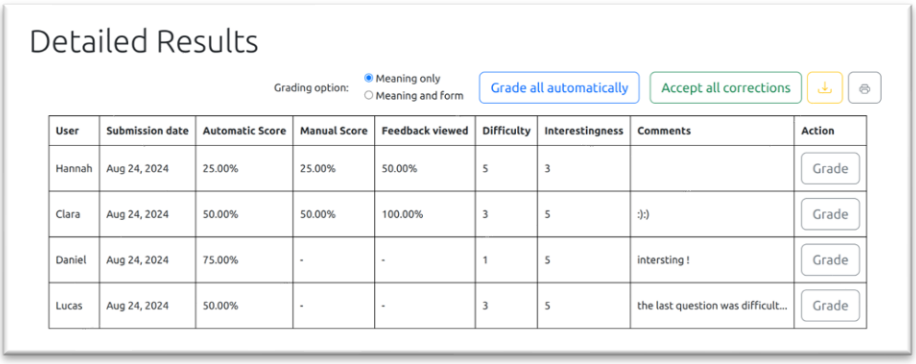


Figure 3. Overall feedback and grading in the evaluation interface

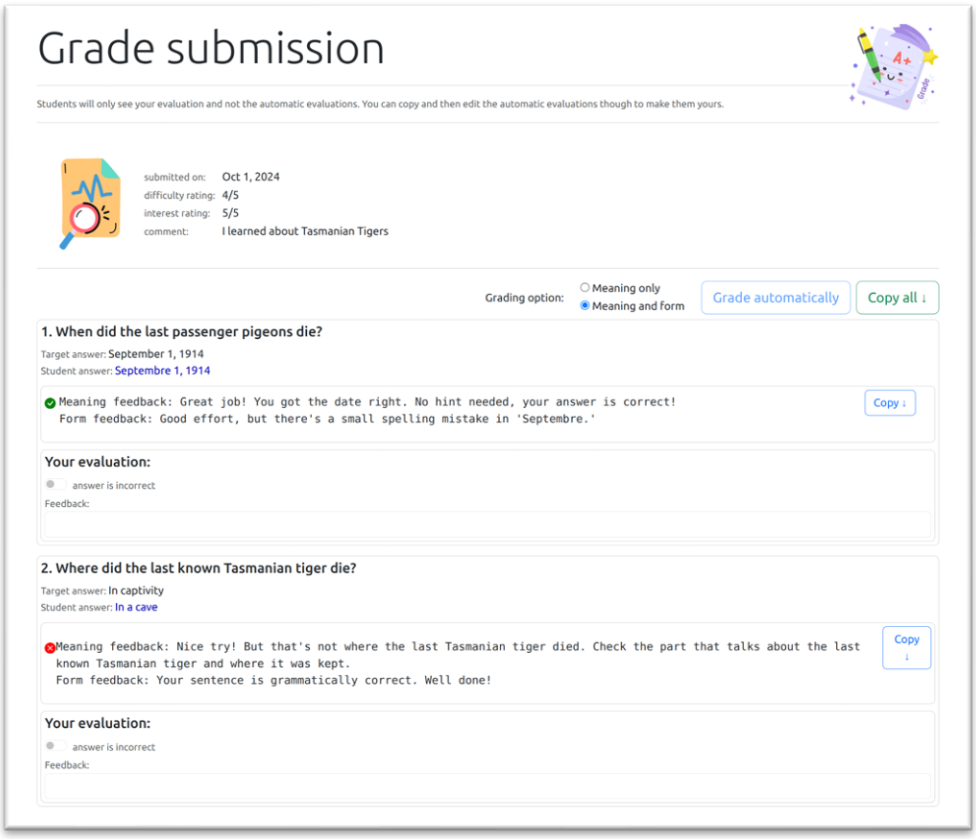


Figure 4. Individual feedback and grading in the evaluation interface

### 3.3. Dashboard

In addition to providing informative and meaningful feedback on learner input, an ICALL system can also offer ongoing assessment and learner progress. ARES is equipped with an extensive user interaction logging system using xAPI[2], an interoperability specification for recording user interactions. The log records the entire interaction between the system and a user, capturing details such as unique student IDs, timestamps, activity types, student inputs, system feedback, and navigation patterns like clicks. This information is stored in a Learning Record Store

[2] https://adlnet.gov/projects/xapi/

 

(LRS). However, choosing which information to display is not straightforward, as not all data from digital learning environments is useful for teaching. Based on iterative consultations with English teachers, we are currently enhancing the teacher dashboard for each assignment to better visualize and inform teachers about learning-related data recorded in the system. In addition to the existing summative information — such as the number of submissions, overall scores, and ratings of the assignment's interestingness and difficulty — and the common mistakes and misconceptions made by students in each assignment as shown in Figure 5, we are currently implementing new functionalities such as tracking words and grammar that students frequently click on, which teachers can bring to and review in the class afterwords.

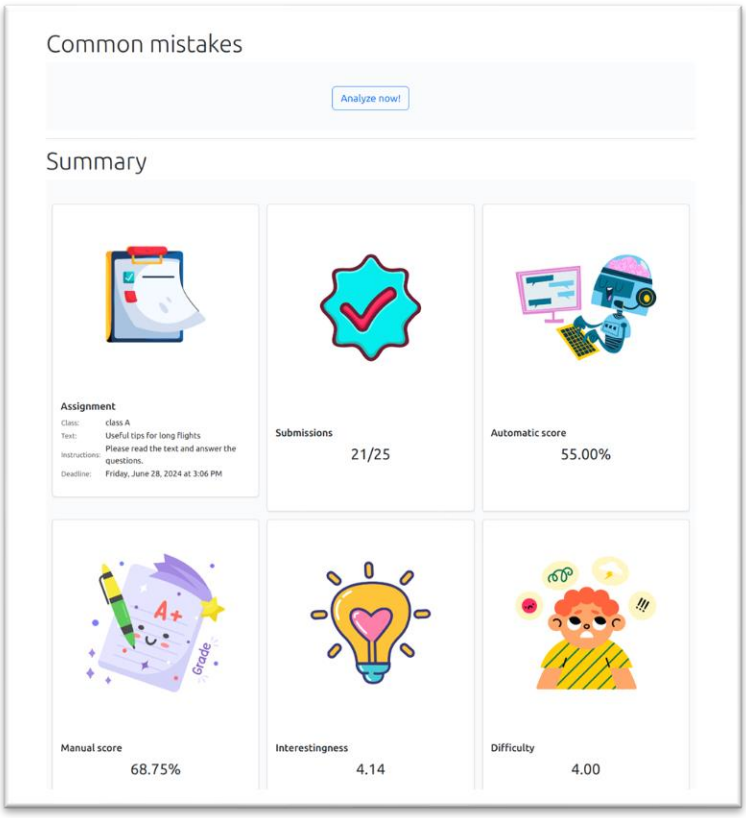


Figure 5. Current summative assessment interface in the teacher dashboard

## 4. Conclusion and future work

In this article, we presented the design and the features of a pedagogically oriented ICALL system ARES, designed to support teachers in real classrooms, aiming to reduce their workload and facilitate personalized teaching practice. We emphasized the importance of considering pedagogical needs and the teacher's role in real-life classrooms when designing and developing ICALL systems. While significantly reducing teachers' workloads through automation with the LLM, ARES also ensures that teachers are involved at every stage of the teaching process, combining AI affordances with teachers' expertise to create a more effective learning and teaching environment. Teachers retain ultimate decision-making power, confirming or editing the system's suggestions, thereby achieving human-AI collaboration in teaching. As the next step, we will investigate teachers' and learners' perceptions and usage of the system in real-life EFL contexts with both adult and young learners. System perceptions by both teachers and learners will be measured using a self-report questionnaire adapted from Lai et al. (2022) for a comprehensive evaluation of educational technology. Teachers' and learners' actual use of the system will be analyzed through log data to further improve the usability of the system.

 

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# ChatGPT and artificial intelligence in higher education in Jamaica: Opportunity or threat? Reviewing stakeholders' perceptions

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***Abstract***

*Stakeholders in academia, including in Higher Education Institutions (HEIs), have questioned the impact of generative Artificial Intelligence (AI), including ChatGPT, on education, whether it poses a threat or brings opportunities to the sector. To date, the debates and conversations are ongoing through various fora organised by different interest groups. While many studies have been published internationally, not much empirical data has been gathered in the Jamaican and wider Anglophone Caribbean contexts. Therefore, this research sought to ascertain perceptions from students and academic faculty about ChatGPT at the tertiary level in Jamaica. Stakeholders from different HEIs responded to a survey with both open- and closed-ended questions, as well as structured interviews. The study adopts the exploratory qualitative content analysis method to analyse the data collected. Preliminary findings suggest that ChatGPT makes academic tasks easier, as it provides quick responses, simplifies explanations, and gives prompts. It is also less time consuming. Conversely, AI makes students lazy/dependent and it limits their critical thinking development. Moreover, the absence of clear AI policies deepens academic faculty's concerns with respect to the validity of students' work, raising concerns about academic integrity.*

***Keywords:*** *ChatGPT; generative artificial intelligence; policy; higher education; Jamaica.*

## 1. Introduction

In November 2022, United States-based company OpenAI released *ChatGPT*, a generative Artificial Intelligence (AI) chatbot – a programme that draws upon a large language database to generate responses from text-based inputs entered by human beings. While AI is not a new phenomenon, the emergence of *ChatGPT* – whose latest version is *ChatGPT* 4.0 – has created a blizzard on the internet and has sparked major conversations in areas such as entertainment, mass media, and education, among many others. The discussions in education surround the quality and sophistication of the outputs of *ChatGPT* and the concerns about ethics and academic integrity as students within Higher Education Institutions (HEIs) may use these tools inappropriately to complete graded university tasks. Madden (2024, p. 12) notes that in prior years "students would rely on the more competent other (a human being) for explanations, ideas, or for proofreading," but *ChatGPT* and other AI tools – which are "disruptive enhancers in the education sector" – have now become the "more competent non-

 

biological other," as they 'think' quickly beyond the speed of the average individual and generate responses to prompts instantly.

During the 2023 spring semester, several academic faculty and administrators across colleges and universities in Jamaica and other Caribbean Community (CARICOM) islands expressed concerns regarding the difficulty in grading certain tasks, as it is at times hard to detect whether students have used AI platforms to help them complete take-home assignments. While local HEIs seek to further understand the impact of *ChatGPT*, the University of Technology[1] (UTech), Jamaica decided to control access to the use of the platform on their campus while the institution reviews its systems to guarantee academic integrity and develop policies regarding examinations and plagiarism (Gyles, cited in the *Jamaica Gleaner*, 2023). As for the University of the West Indies[2] (UWI), Mona, the institution had not yet settled on a position, although it acknowledged that the advent of the platform continued to exercise the minds of administrators and professors (Stanberry, cited in the *Jamaica Gleaner*, 2023). These stances and caution taken by both UTech and UWI suggest that, at least during the early stages of its accessibility to the public, ChatGPT was perceived to be a threat to Jamaican universities.

To date, several academic faculty and administrators have shared mixed views through departmental meetings, research conferences, and newspaper columns on whether *ChatGPT* is a threat or an opportunity to HEIs. Some have raised concerns about ethical practices, while others have called for stakeholders to be more open-minded and conduct empirical research to determine how *ChatGPT*, and generative AI in general, could be employed to the advantage of both educators and students. Samuels-Waite (2023, p. 14) – a lecturer in the Faculty of Education at the Mico University College[3] – underscores that while the default posture of academics may be to become strict in their punishment of students who use *ChatGPT* to plagiarise, "*ChatGPT* presents us with a unique opportunity to think creatively about how we design and administer assessments [coursework assignments and tests/exams] at this level."

Despite its increased usage in Jamaica and the Caribbean, the region falls short on empirical data regarding the inclusion of *ChatGPT* for academic purposes in HEIs. Many varied opinions have been voiced, but not many scientific studies have been conducted to achieve a wider scope of usage and perceptions of the chatbot. Consequently, this paper sought to examine the points of views of different stakeholders within HEIs concerning *ChatGPT* and AI and their implication for policy implementation. To achieve this, the study is guided by the following research questions:

1. What are Jamaican higher education institutions' stakeholders' perceptions on the use of *ChatGPT* and artificial intelligence for academic purposes?

2. What implications do *ChatGPT* and artificial intelligence have on policy implementation in higher education institutions in Jamaica?

It is hoped that the findings from this study will add insights to the international body of literature on *ChatGPT* and AI in higher education, as well as serve as an initial source document to guide ongoing discussions, practices, and usages of generative AI in HEIs, primarily in Jamaica and the Caribbean/CARICOM region.

## 2. Literature Review

Despite being on the market for only two years, *ChatGPT* has gained prominence as an innovative AI service that caters to humanity's quest for information, delivering answers, and proposing solutions online with notably performance (Macdonald et al., 2023). As established in the literature, *ChatGPT* has been used widely globally in

[1] UTech is the oldest public university in Jamaica.

[2] UWI is an internationally ranked regional university with campuses in Jamaica, Barbados, and Trinidad, and centres in other Caribbean islands.

[3] The Mico University College is the oldest public teacher-training tertiary institution in the Anglophone Caribbean.

 

the education sector, especially at the secondary and tertiary levels. Mogavi et al. (2023) note that concerning the chatbot, productivity, efficiency, and ethics are among the most commonly discussed aspects on social media platforms. Zhai (2022) points out that the usage of *ChatGPT* has the potential, in academic contexts, to generate systematic, cohesive, mostly accurate, and useful publications. Thus far, *ChatGPT* has: successfully produced literary works, such as poems, songs, and essays; write, suggest improvements to, or troubleshoot errors in computer code; translate texts from one language to another, including being able to translate into Jamaica Creole (Patwa); and produce lesson plans, as well as design curricula for educators (Dilmegani, 2023).

Sulisworo and Dahlan (2023) reveal that academic faculty utilise *ChatGPT* for different aspects of their teaching, including generating ideas, gathering information for lectures, translating writings, and creating questions for deeper understanding of the topic. Notwithstanding, academic faculty opine that one should be critical and cautious when using the chatbot. Concerning students, Hasanein and Sobaih (2023) indicate that they use ChatGPT to complete take-home assignments, function as a writing assistant, solve problems, prepare and revise for tests, analyse data, obtain conceptual clarification, support research, and provide additional learning materials. However, many academic faculty members are not in favour of the platform, citing that it leads to plagiarism and increases cheating (Bin-Nashwan et al., 2023; Ahmed et al., 2022). In fact, Banovac (2023) highlights that different experiments show that many students who use ChatGPT to write essays have received lower scores compared to those who write their papers manually. This shows that by solely relying on ChatGPT, students are incapable of writing authentic, quality content. However, studies also show that students primarily use ChatGPT for academic content construction, obtaining information, uniqueness, and expediency (Jishnu et al., 2023).

**Advantages and Limitations of ChatGPT in Higher Education**

According to Das and J.V. (2024), students have a high level of comfort and acceptance of new technologies, and their consistent usage of ChatGPT has helped them to develop new habits. Strzelecki (2023) notes that students welcome ChatGPT's multilingual user-friendly interface, which operates effectively with minimal prompts. Athanassopoulos et al. (2023) underscore the chatbot's potential as a learning tool to improve foreign language learning and writing in a multilingual and multicultural context. ChatGPT also presents the opportunity for educators to customise and appropriate their teaching content, foster increased student involvement, motivation, and academic achievement (Guo et al., 2023). Additionally, the chatbot offers teachers the means to quickly evaluate students' assignments and provide personalised and constructive feedback, as revealed by a study conducted by Javaid et al. (2023) and Kostka and Toncelli (2023). Furthermore, using ChatGPT helps to alleviate teachers' burden in terms of lesson planning, as it plays the role of a research assistant and generates content in response to prompts. However, limitations include its inability to understand like a human, replace human knowledge and capacity, and the insufficiency of its data (Khan et al., 2023; Shidiq et al., 2023 and Zhai, 2023).

## 3. Method

The current study uses an exploratory qualitative approach to ascertain perceptions from higher education stakeholders (students and academic faculty) in Jamaica about *ChatGPT*. As the aim was to solicit the perceptions of these individuals, purposive sampling was the dominant technique used. However, we also recognised the benefits of snowball sampling to extend the reach of our survey; therefore, participants were also asked to share the survey with other higher education stakeholders in their network.

Data was collected over four months – February to May 2023 – in two distinct phases. First, a survey was created and administered via *Qualtrics* and disseminated via social media (mainly *WhatsApp*) to tertiary students. The survey included a combination of both open- and closed-ended questions and centred around probing participants' knowledge of and engagement with *ChatGPT* and perceptions about the advantages and disadvantages of the platform. Although 68 individuals from various local HEIs responded to the survey, our final sample was reduced to 21 students and 8 academic staff members, after eliminating ineligible respondents and incomplete surveys. Second, we used structured interviews, administered via email, to probe some of the emerging themes from our

 

survey data among 14 academic faculty, as well as ascertain their views on *ChatGPT's* impact on academic policy.

## 4. Results

Qualitative data obtained by this study on the perception of C*hatGPT* has been categorized according to the following areas of interest to the researchers: notions of AI (respondents' awareness of AI); usage of *ChatGPT* (whether respondents have used the tool); benefits of *ChatGPT*; usefulness of ChatGPT/AI (for what purposes is the tool ideal); disadvantages of ChatGPT/AI (risks and challenges associated with their use); and ChatGPT/AI policy (whether generative AI policies exist at respondents' institution).

### 4.1 Notions of AI

All the student respondents (N=21), who are from a wide range of institutions and academic disciplines, provided notions of their understanding of AI, which encompasses generative intelligence through computerised machines that complete both linguistic and content specific tasks and produce information with great efficiency. One student noted that AI is "computer-generated intelligence that is trained through multiple interactions with humans; it seeks to bypass human intelligence to perform complex tasks that would take humans more time to complete."

### 4.2 Usage of ChatGPT

Of the participants whose data was analysed (N=43), 47% said they have used *ChatGPT*, 33% said they have never tested the platform, while 20% did not provide a valid response. Students who have used the platform did so for varied reasons, including: as an aid with difficult courses; complete research and projects; write codes, speeches and letters; provide prompts for fictional works; generate ideas for assignments; "write responses when too lazy to think"; and simply out of curiosity or to test its limits and functions. One student commented, "I found it fascinating so I mainly used it to play around and test what it could do," while another said, "I heard about it and wanted to see… [what] something like this so intelligent was really about". A small contingent of students (N=3) indicated that they used the chatbot for critical thinking reasons, comparing responses to validate their interpretations of materials or questions. In addition, academic faculty (N=8) indicated using *ChatGPT* to generate ideas for projects, create lesson plans, write sample essays and speeches, create tests and quizzes, review research papers, and analyse thesis statements.

### 4.3 Benefits of ChatGPT

Students indicated numerous benefits of *ChatGPT* in higher education, such as: the simplification of academic tasks, both in terms of understanding and composing; the provision of quick responses with full and simple explanations; the accessibility of information within real-time (less time-consuming); the compilation of information from a wide range of credible online sources and databases; and the generation of information through limited prompts and predictive writing.

Academic faculty note that students can use *ChatGPT* to practise or have topics explained to them in the absence of their teachers. For example, a student engaging in personal reading at home may prompt *ChatGPT* to explain information on which they need clarity, thereby readily accessing knowledge without the need to contact their lecturer outside of class. Additionally, the platform can be used to increase creativity in brainstorming ideas and instructors can use it to expose students to textual models. Furthermore, *ChatGPT* can foster more analytical thinking, thereby promoting more research and writing necessary for national educational development. The chatbot also provides more perspectives for robust discussions and depth in exploring content. It challenges instructors to ask better questions and not rely on testing lower-order skills. Moreover, *ChatGPT* offers strong support to human teachers, operating as a compendium of information about any topic and supplying that information instantaneously. Therefore, it helps to facilitate the delivery of instruction and can accelerate the researching and evaluating of students' data. Furthermore, it can provide a guideline for students to write academic papers and for academic faculty to prepare lectures.

 

### 4.4 Usefulness of ChatGPT/AI

When respondents (N=43) were asked about their impression on the usefulness of ChatGPT/AI in higher education (see Table 1), the majority (N=17) chose that it makes work easier. The second significant majority (N=10) indicated that it provides prompts and ideas to help complete tasks. Other responses included that it was a "faster way of processing information" (N=5) and "completes tasks ordinarily too complicated for humans" (N=5).

**Table 1**. Higher education stakeholders' impressions of the usefulness of ChatGPT/AI

| Description | Number of participants |
|---|---|
| Provide prompts/ideas to help complete tasks | 10 |
| Makes work easier | 17 |
| Faster way of processing information | 5 |
| Completes tasks ordinarily too complicated for humans | 4 |
| Unsure/No response/irrelevant | 7 |

### 4.5 Disadvantages of ChatGPT/AI

Several disadvantages were presented by the respondents concerning the use of *ChatGPT* and AI in higher education (see Table 2). Some posited that the platform can lead to low productivity and limited creativity in students (N=11), while others mentioned the potential of students becoming intellectually lazy or too dependent on the AI (N=7), which affects critical-thinking, problem-solving and research skills. Others highlighted the potential of academic dishonesty in the form of cheating and plagiarism (N=8). Other perceived disadvantages include the absence of credible sources, the threat of job security, the decline in socialisation, the possibility of it being used for illegal gains, and the cost applied to use the platform. Still, two academic faculty members do not believe that *ChatGPT* poses a threat to higher education.

**Table 2**. Higher education stakeholders' impressions of the disadvantages of ChatGPT/AI

| Description | Number of participants |
|---|---|
| Underdeveloped human skills (critical thinking, research skills, etc.) | 11 |
| Encourages laziness and poor socialization | 7 |
| Susceptible to plagiarism and unscrupulous/illicit activity (hacking) | 8 |
| No longer free to use | 1 |
| Supplies inaccurate or wholly incorrect responses; highly censored | 8 |
| Requires very specific instructions to produce accurate responses | 3 |
| A threat to job security | 2 |
| Not sure or no threat | 3 |

 

### 4.6 ChatGPT/AI policy in higher education

From the structured interviews conducted with academic faculty (N=14), all of them noted that they were unaware of any specific policy that has been developed or implemented to address the use of *ChatGPT* within their respective institutions. One respondent, however, noted that "policies are currently being discussed in order to be implemented as soon as possible." Another stated that at their institution, "the university has broad policies for academic integrity and for dealing with matters of plagiarism/cheating. I believe the broad policy is applicable to AI, despite not being specific to AI." Additionally, at the same institution, the university "has shared a very comprehensive set of resources to faculty members with regard to *ChatGPT*/AI and how it affects education policy globally. The university has also hosted numerous seminars and discussions on the issue."

Academic faculty also shared divergent views on the direction that their institutions could take concerning the utilisation of *ChatGPT* and AI. The notion of context was highlighted, which takes into account the type of dialogue that exists in the institution between the administration and the student body. One interviewee pointed out that "*if the institution is student-centered, then the most natural thing… is to initiate meetings with/among the students in order to establish dialogue and communication on the subject of AI/ChatGPT. Students need to be informed as to what it is about and the dangers it could pose. The objective would also be for students to understand the need to learn how to think for themselves, solve problems by themselves, and not depend on machines to replace their brains*." However, if the institution is not student-friendly, "students may simply be told that sanctions will be imposed if AI/*ChatGPT* is used to do assignments."

These stakeholders propose different approaches to combat students' usage of and reliance on *ChatGPT*. They suggest that teaching faculty need to develop assignments that students are capable of doing without external help. In addition, written work may have to be done under supervision and written by hand, with no computers, tablets or smartphones allowed in the room.

## 5. Discussion

This study sought to ascertain HEI stakeholders' perceptions on *ChatGPT* for academic purposes and its implication on academic policy. As observed in the findings, there are mixed views concerning its usage and usefulness. The findings are consistent with studies cited in the literature that students and academic faculty utilise the chatbot for various reasons, such as a prompt generator for ideas, an assistant to complete take-home assignments, a guide to explain complex tasks, and a source to produce lesson plans to create pedagogical materials (Dilmegani, 2023; Dahlan, 2023; Hasanein & Sobaih, 2023). While majority of the stakeholders use *ChatGPT* as an information-generating hub, a few students use the chatbot for critical-thinking purposes to compare their responses and confirm their understanding and interpretation of materials or questions. This suggests that students should be meticulous with their usage of the platform and use it as a complementary source of assistance as opposed to depending entirely on it to achieve their tasks. Academic faculty have raised concerns that students' dependence on the chatbot may result in low productivity, lack of creativity, and intellectual laziness. This may weaken their analytical and problem-solving skills. This position supports Banovac's (2023) study in which different experiments show that many students who use *ChatGPT* to write essays have received lower scores compared to those who write their papers manually. This further validates the point that total reliance on *ChatGPT* may render students incapable of producing original, quality content. Furthermore, this may lead to plagiarism and an increase in cheating, which is a serious concern among many academic faculty (Bin-Nashwan et al., 2023; Ahmed et al., 2022).

But even for academic faculty, they, too, are not to simply copy and paste the ideas and content generated by *ChatGPT*; instead, they should scrutinise them for accuracy and adjust them according to their specific learners' profiles and precise objectives to be achieved. Indeed, the chatbot makes work easier, as it can rapidly evaluate students' assignments and provide personalised feedback (Javaid et al., 2023; Kostka & Toncelli, 2023) as well as alleviating the burden of lesson planning. Notwithstanding, it is incapable of fully behaving like a human (Khan

 

et al., 2023; Shidiq et al., 2023; Zhai, 2023). Therefore, academic faculty will still have to bring the human touch to their lesson and relate to the socio-cultural contexts of their students and learning environments.

Concerning policy in HEIs to address the use of *ChatGPT* and AI, no institution has any specific framework, although some universities have general regulations with regard to plagiarism, which are applicable to *ChatGPT*. Nevertheless, questions of ethics and academic integrity are often raised (Mogavi et al., 2023). Consequently, HEIs need to establish clear guidelines on the chatbot's usage for both faculty and students. Otherwise, it may result in certain academic faculty and departments applying sanctions for its usage while others accept content generated by it. As revealed in the findings, two lecturers said they had no issue with its incorporation. The lack of clear policies may lead to inequity among the students. Furthermore, a policy would likely outline the pros and cons of the chatbot to guide both students and academic faculty. They would understand the leverage they have with the platform, what constitutes an infraction, and the consequences of any possible violation.

In the absence of a policy, academic faculty and administrators will have to rethink how they conceptualise and deliver lectures and assignments. This will require creative and innovative initiatives and non-traditional forms of evaluating learning.

## 6. Conclusions

Our study examined the perceptions of HEIs stakeholders on the usage of *ChatGPT* and AI for academic purposes and its implication for policy implementation. Major findings indicate that ChatGPT makes work easier, as it provides prompts and ideas to complete tasks. It simplifies academic tasks for students, provides access to a database of information within real-time, which makes it less time-consuming, and it generates information through predictive writing. Some academic faculty members believe it can serve as a tutor for the students in their absence. Additionally, the platform can help to reduce academic faculty's workload by supporting them in lesson planning, activity designing, correction of assignments, and giving of feedback.

However, some academic faculty and students are concerned that reliance on the platform may affect creativity and critical-thinking skills. Moreover, AI's susceptibility to producing false information under the guise of credible sources raises serious concerns about academic integrity. Nevertheless, stakeholders have to be deliberate in using the chatbot as a complementary support and not for total dependence. Furthermore, one of the greatest concerns of academic faculty is that of academic dishonesty. Questions of ethics and academic integrity are often cited by educators. Despite this, Jamaican HEIs are still without specific policies to address the use of *ChatGPT* and AI. The absence of precise regulations may lead to inequity in student assessment. In the meantime, academic faculty and stakeholders have to be creative and innovative in their design, administration, and correction of lectures and assignments.

While this study addresses initial perceptions of Jamaican HEI stakeholders on *ChatGPT*, the authors invite academic faculty to incorporate the chatbot in different ways, whether for lectures or adminstrative purposes, to conduct different experiments to have a broader representation of the affordances and limitations of ChatGPT and AI in HEI contexts.

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# Enhancing human-centric CALL through AI innovations

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***Abstract***

*This paper explores the integration of Artificial Intelligence (AI) into Computer-Assisted Language Learning (CALL) to create a more engaging and supportive educational experience. This study delves into the utilisation of Natural Language Processing (NLP), AI image generation and text-to-speech (TTS) technologies to enhance the game-like elements of CALL resources. Drawing from recent experiments, the paper discusses the iterative improvements made to the Cipher game (Xu et al., 2024), shedding light on the positive impact of AI on both user experience and learning outcomes.The integration of NLP, AI image generation and TTS AI in CALL resources, as exemplified by the Cipher game, demonstrates their effectiveness in creating engaging and inclusive language learning experiences. These technologies not only improve productivity but also cater to the needs of learners with diverse requirements. This paper advocates for further exploration and implementation of AI in CALL to promote humanity, interactivity, and accessibility in language education.*

***Keywords:*** *CALL; Artificial Intelligence; digital game-based language learning.*

## 1. Introduction

In recent years, the role of AI in educational technology has become increasingly significant, including in the field of CALL. The intersection of AI and CALL holds immense potential for transforming language learning experiences. This paper delves into the incorporation of AI, specifically Natural Language Processing (NLP), AI image generation and TTS synthesis, to foster more human-centric and inclusive CALL resources. While these technologies have been used in CALL resources before, they have become increasingly more powerful and accessible to developers to use and integrate into CALL resources. This paper provides an outline of these AI technologies and how they can be used in CALL development.

## 2. Background

A comprehensive explanation of AI is outside the scope of this paper and this section provides an overview of AI, along with a short explanation of AI, false dawns in relation to AI and the use of AI in CALL. It provides a short summary of Natural Language Processing, AI image generation and TTS systems and their role in CAL.

 

### 2.1. General overview of Artificial Intelligence

Since the public release of ChatGPT 3.0 in November 2022, the general public has become more aware of the existence of Generative AI (GenAI) tools and their usage. Those not previously familiar with AI tools in general and GenAI tools in particular were amazed at what they could do. In educational settings, particularly in Higher Education, there were initial concerns in relation to academic integrity, as there were fears that students would use the GenAI tools to do their assignments for them (Sullivan et al., 2023). Although this continues to be a concern, there are potential benefits for integrating AI into teaching and learning (Grassini, 2023). While AI can be used in a variety of ways, directly as a general tool to support learning, this paper focuses on leveraging AI tools in the development of CALL resources.

There is no singular definition of AI, but it can be defined as the use of computer technology to simulate human intelligence and problem-solving capabilities (Wang, 2019). The general public has gained most of its perceptions from films and books, which can sometimes give the idea that AI robots can 'think' or 'feel'. However, this is not true with the current state of AI development and it may then become a philosophical question if it is even possible for a non-human to 'think' and 'feel'. Generative AI (GenAI) is AI used to generate resources (e.g. text, audio, video) in response to prompts and queries. ChatGPT was the first GenAI tool that the general public became aware of, but it is not the only one and certainly not the first one. AI has been around for a very long time since the early days of computing, and even before than in a non-computing form (Muthukrishnan et al., 2020). Over the years, elements of AI have had different names (e.g. expert systems, intelligent systems) and sub-fields of AI have their own specific names.

When computing technology became available in the 1940s and 1950s, there was great hope that AI could be harnessed to carry out difficult tasks and there were some initial successes from the 1950s to 1970s (Haenlein & Kaplan, 2019). However, there were many difficulties including computing power and finance issues. In the 1980s, there was a brief flurry of activity in AI, but it is mainly since the late 1990s and early 2000s that AI has really become more common and used outside the lab environment. Tasks that could only be performed in specialised computer labs, can now be performed by the general public on a daily basis. For example, many people use a spelling and grammar checker when using a word processor, yet they are unaware that it is AI that is powering the checker - they can use it seamlessly without thinking about the technology behind it.

AI has been used in CALL for many years. The use of AI in CALL has often been referred to as Intelligent CALL (ICALL). It has been used with written learner language in spell checkers, grammar checkers including systems for automatic writing evaluation, and Intelligent Language Tutoring Systems (ILTSs) (Heift, 2017). It has also been used to enhance reading, listening, and speaking (Woo & Choi, 2021). In more recent years, Natural Language Processing (NLP) and TTS tools have been used in CALL resources.

### 2.2. Natural Language Processing and CALL

Natural Language Processing (NLP) is the use of computing technologies to process human language. NLP tools and technologies include text and speech processing, morphological analysers and automatic text summarisation. Many language learners currently use NLP-embedded tools for writing (e.g., spelling and grammar checkers (Ferris et al., 2013). NLP tools have the potential to enhance the development of CALL resources and also enhance their power (Ward, 2017; Ward, 2019). However, there have been difficulties in using NLP in CALL over the years. One fundamental issue is the cross-disciplinary nature of the integration - it can be challenging for NLP researchers to work with learners and CALL researchers to work with NLP technologies that they may not understand. NLP researchers focus on the technical aspects of NLP, while pedagogy is the main focus for CALL researchers. Furthermore, NPL tools are not designed for language learning activities and it can be difficult to adapt them for language learning purposes (Antoniadis et al, 2013). Other challenges, such as CALL development difficulties (Goewin-Jones, 2015), integration (Heift & Schulze, 2007), financial constraints and the difficulties in building a multidisciplinary team, are also an issue (Ward, 2015).

 

### 2.3. Artificial Intelligence images and CALL

Images have the power to help contextual written texts and can make CALL resources more visually appealing (Schroeder et al., 2011). AI image generation is complex and requires input parameters or conditions (prompts) to generate an image based on what it has learnt based on previous images it has seen (training images). AI image generators can generate images of things real or imaginary. Some benefits of AI image generators include time-saving, cost efficiencies, the ability to customise images, scalability, consistency and accessibility (especially for those who lack design or artistic skills) (Vimpari et al, 2023). However, there are also issues with AI generators. There are ethical concerns around the use of images used to train the generators and whether or not there are copyright issues, the impact on artists and designers, the generation of inappropriate images and the use of tools to create deep fake images (Vimpari et al, 2023). AI generated images have become very realistic in recent years. There is a phenomenon with AI images and virtual humans called the uncanny valley. This is where images or virtual humans appear real but there is something 'different' about them and this can cause an uncomfortable sensation in the viewer. Recent AI tools (e.g. MidJourney and Dall-E) can generate images that are very realistic, with less of the uncanny valley effect. However, there are still residues of this in the images, but sometimes viewers have to look hard to find 'strange' elements. One area that AI images struggle with is human hands and their rendering of hands is sometimes 'weird'. The prompts provided to AI image generators are key to successful generation of images. It can be difficult to get the AI generators to generate similar images for a sequence of pictures. While AI image generators have been around since the 1970s, it is only in recent years that they have become available, usable and (financially) accessible to the general public.

### 2.4. Text-to-Speech and CALL

Text-to-Speech (TTS) is a technology that reads digital text aloud. It converts words into their audio equivalent. TTS technology has been used to aid blind and visually impaired people to 'read' digital text. In the early days of TTS, the technology was clunky and only available for a limited number of languages, particularly English, but today the technology works really well and is available for many languages (Pratap, 2024). TTS tools can also be used to help others with reading difficulties. This includes those with dyslexia (particularly if they do not have auditory processing issues as well) and other reading difficultie. TTS tools can be integrated into devices, accessed via the web and in specialised apps. They can be used to support students with reading difficulties, in conjunction with their usual school supports (Keelor et al., 2023) In terms of language learning, TTS can also be helpful to learners (e.g., Cardoso et al., 2015), especially if they are unfamiliar with the L2 writing system. It can be used to help in pronunciation (Fouz-González, 2015).

## 3. Methodology

### 3.1. Context

Cipher is a Digital Game-Based Language Learning (DGBLL) application that asks players to find words that have been put under a spell by an evil character. There are different types of spells and the player has to spot a given number of words under a spell and identify the spell to progress through the game. The initial version of Cipher was developed in English and was subsequently adopted for Irish for beginners (Xu et al, 2024). The initial Irish version of Cipher was played successfully by primary school students (see Figure 1), but there was room for improvement in terms of the language content, visual appeal and accessibility for students. With this in mind, three AI technologie were used to enhance Cipher: NLP, AI images and TTS.

 

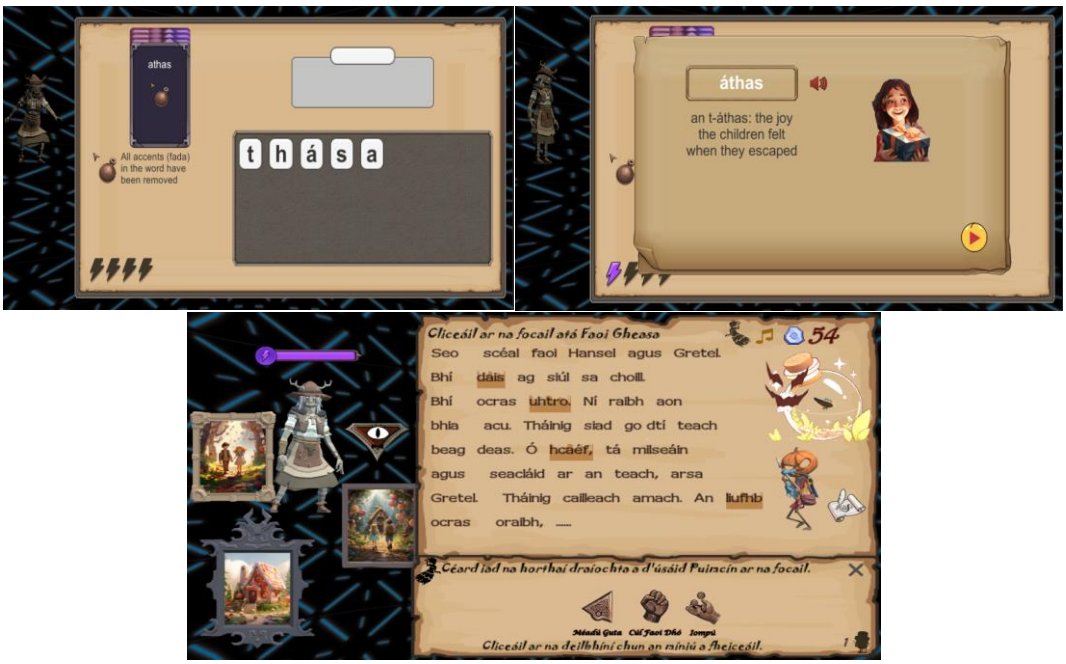


Figure 1. Screenshots of Cipher

### 3.2. NLP in Cipher

NLP tools are used in several ways in Cipher. NLP tools were used to check for spelling and grammatical correctness, a Part-of-Speech (POS) tagger was used to determine the lexical complexity of the learner texts and a POS tool was used to provide XML formatted POS tagged text to Cipher. It is important to ensure that the texts presented to the players have no spelling or grammatical errors (apart from the spells introduced by the evil spirit) and an NLP tool was used to check for correctness.

In CALL resources, it is really important that the language used is at the correct level for the learner (Hashemi, & Aziznezhad, 2011). For the most commonly taught language, there are many tools available to check the difficulty of a piece of text (Benjamin, 2012). These tools consider lexical complexity, grammatical complexity, sentence length and other features. In the case of Irish, these tools are not available and there was a need to develop tools to ensure that the texts in Cipher were at the correct level of difficulty for learners. The NLP text level analyser tool for Irish involves lexical analysis, grammatical analysis and frequency analysis. Moreover, Irish text classification using Large Language Models was also investigated (Mc Cahill et al, 2024).

The evil spirit in Cipher can choose which category of words to put under a spell. It is important that certain word categories (e.g. proper nouns) are not put under a spell. A POS tagger for Irish (Uí Dhonnchadha and van Genabith, 2006) provides XML formatted POS tagged text to the Cipher engine so it can choose to highlight particular parts of speech. This POS information is important for differentiating noun gender in Irish (i.e. masculine and feminine nouns) and it enables the Cipher game to display masculine nouns in blue and feminine nouns in red in the Cipher game.

Initially, there were plans to use a POS tagger to analyse texts produced by learners. However, the texts produced by players to get extra points when they ran out of points were at a very basic level and could not be used for this purpose. Some of the texts were in English and others were not full sentences. In order to support learners, later versions of Cipher allowed the players to gain points by joining word bricks together to make a sentence in Irish. This word brick approach had been used successfully before (Purgina et al., 2017) and it worked well in this context also.

 

### 3.3. AI images in Cipher

Our initial exploration of AI image generation in the Cipher game (Xu et al., 2023) revealed promising results. While AI was quicker than human efforts in terms of image creation, human intervention and iterative refinement were necessary. Building on this foundation, subsequent developments have seamlessly integrated AI-generated images into the game, presenting three sequential images per page aligned with the storyline. This evolution not only enhances comprehension but also transforms these images into interactive game components. It was important to ensure that the images were appropriate and consistent. The approach was to use a slightly cartoon like, rather than aim for realistic images. The aim was to stay aligned with the overall look and feel of the Cipher game.

Figure 2. AI-generated images in Cipher

### 3.4. Text-to-speech in Cipher

A notable addition to the Cipher game is the implementation of TTS AI, designed to assist learners, particularly those with dyslexia. This AI synthesised voice enhances the game's storytelling element, and ensures that learners with textual reading difficulties can fully access instructional and motivational game support. While the Cipher game is designed to be simple and easy to use for learners, sometimes there may be a need to provide extra support. The addition of audio support can help learners play the game independently and not rely on the help of the teacher or another student.

TTS was also used to support the vocabulary learning element of Cipher. abair.ie is a TTS tool specifically designed for Irish and can generate audio files in three different dialects of Irish and at different speeds. abair.ie was used to generate the audio files for each of the vocabulary words. Irish orthography is not transparent and it can be difficult for learners to decipher the correct pronunciation of Irish words (Hickey & Stenson, 2011). It is essential for learners to know how to pronounce words correctly as part of the language acquisition process.

### 3.5. Description of testing

The testing of the enhanced version of Cipher took place in two English-medium primary schools in Ireland. There were three cohorts - cohort 1 and cohort 2 were from an all-boys primary school. The participants were between 10 and 12 years of age and had learnt Irish orally and aurally for five years, and Irish reading and writing for three years. The learners played the game on tablets, generally individually, but sometimes in pairs. Cohort 1 played the game for 10 weeks, while cohort 2 played the game for five weeks. Each session lasted around 30 minutes, including the time for setting up and exiting the game. The students could play the game at their own pace and generally played with teacher or CALL researcher assistance, but it was available if required. Cohort 3 was an all-girls school and participant ages ranged from 10 to 12. These students played the game for three weeks for 1 hour at a time. The differences in number and length of sessions was due to timetabling issues with the classes in the schools.

There were various elements assessed as part of the Cipher evaluation process with the students. These included the usability of the game, the learning effects and students' opinions on the game itself. A double baseline approach was used to test the learning effects (Üstün-Yavuz, 2024). This paper focuses on the impact of NLP, AI images and TTS in Cipher.

 

## 4. Results, Discussion and Limitations

### 4.1. NLP and Cipher

The integration of NLP tools in the Cipher game proved to be effective in ensuring that the texts presented to learners were at the appropriate difficulty level. The use of NLP in text analysis facilitated the classification and adaptation of texts according to the linguistic proficiency of the learners. By analysing lexical, grammatical, and discourse features, the system ensured that texts were neither too challenging nor too simple, maintaining learner engagement and motivation. NLP tools were instrumental in providing XML-formatted POS-tagged texts, which were used to highlight grammatical features such as noun gender, enhancing the pedagogical value of the game. This adaptation of NLP tools is crucial for less-resourced languages like Irish, where pre-existing educational resources are limited. Overall, the approach of incorporating NLP into Cipher not only worked effectively but also provided a scalable model for other low-resourced languages, ensuring texts are pedagogically sound and appropriately challenging for learners.

### 4.2. AI and images

We were able to generate images that aligned well with the Cipher stories. There was a lot of trial and error and it was difficult to generate consistent images. There was also the issue of strange images, as well as images that were inappropriate (e.g. the use of the word witch meant some images of horrible women were produced or an adult themed 'witch' was generated). Comparing the outcomes of the earlier study with the recent experiment showcases noteworthy improvements. The further integration of AI-generated images and resolved issues related to game progress has led to a more positive reception from learners. In the recent experiment, out of 31 survey responses, 57% expressed a positive inclination towards the story images, surpassing the 51% recorded in the previous study (Xu et al., 2023). Regarding comprehension, 45% of respondents perceived the story images as facilitative, marking a notable increase from the earlier 27%.

**Table 1:** Comparitve results for Cipher with AI images

| | Previous version with AI images | Recent version with AI images |
|---|---|---|
| Do you like the images in the story? | 51% | 57% |
| Do the images in the story help you understand the story? | 27% | 45% |

### 4.3. Text-to-Speech (TTS)

TTS technology, i.e. elevenlabs.io, was used to generate the audio files for Cipher's English interface Help features. This ensured consistency and clarity of pronunciation throughout the game. It was also advantageous for the Cipher team to be able to use Irish TTS abair.ie to generate the Irish audio files. This ensured that the audio files were correct and consistent, and did not rely on the need to have a native speaker available to record the words. This level of accuracy and consistency is particularly important for novice and young, inexperienced learners. The students across cohorts 1 and 2 reported that while they liked the audio (48%), only 26% said that the audio helped them play the game. For cohort 3, only 21% liked the audio and also only 21% said it helped them play the game. The TTS tool generated words in English with a UK Received Pronunciation (RP) accent which is different to English with an Irish accent, (one student has heard to say "*I do not like the woman's voice it is annoying*"). This illustrates the importance of software localisation, and in future versions of Cipher we intend to add an Irish accent as a choice for the mainly Irish users of the game.

 

### 4.4. Discussion

CALL researchers aim to integrate new technologies into the language learning process. However, due to the difficulties in doing so, they often only choose one technology for new CALL resources (O'Brien et al., 2020). For instance,they may choose to use NLP techniques to ensure that the texts are correct and at the right level for learners. They may use AI generated images to make the game more interesting and engaging for learners. They may use TTS to provide audio guidance and pronunciation support for learners. The Cipher DGBLL app combines all three AI technologies in a pedagogically informed manner to create an engaging learning resource for students. It would not have been possible to choose suitable texts objectively and check their correctness without NLP tools. It would not have been possible to have suitable images in the app without the use of an AI image generator. It would have been possible, but much more challenging, to provide audio files in English and Irish for the app without the use of TTS tools.

This approach could be used by other CALL researchers. There may be suitable NLP tools available for the language of study, particularly if it is a well-resource language. If NLP tools are not available, rudimentary NLP tools could be developed using standard features (e.g. sentence length and lexical complexity). AI image generators are commonly available and can generate a wide range of images, independent of context. TTS tools may be available for the language of study and more will become available in the future, particularly as Generative AI tools increase their range of languages covered. The utilisation of some AI tools have a steeper learning curve than others (e.g. AI image generators), but the AI tools outlined in this paper have all contributed to enhancing the Cipher game and should be considered by CALL researchers looking to enhance their portfolio of CALL resources.

### 4.5. Limitations

There are several limitations of the current study, including cohort size, duration of testing and survey size. The game was only tested in two schools so there is a need for further research with a larger cohort of students. The students in cohort 1 played the game for 10 weeks, cohort 2 for five weeks and cohort 3 for three weeks (but for a longer duration per session). It would be preferable to test Cipher over a longer period of time, but it is challenging to test CALL resources in primary schools, especially when the CALL team are not primary school teachers in the schools in question. Student surveys can provide valuable information, particularly if there are many probing questions. However, due to the age of the student participants, it was necessary to limit the number of questions asked in the surveys. This meant that it was difficult to do a deep dive into specific aspects of the game e.g. images and audio components. Further research is required to carry out a more detailed analysis of these components.

## 5. Conclusion

The objective of this research was to explore the use of three AI technologies (Natural Language Processing (NLP), AI image generation and text-to-speech (TTS) technologies) to enhance the game-like elements of CALL resources. AI technologies can enhance CALL resources, but they can be difficult to integrate in a pedagogically sound manner into such resources. The NLP tools helped to ensure the quality of the texts, the AI generated images made the stories more engaging and the TTS made the game more accessible to learners of different abilities. These results demonstrate that by using AI resources in a focused manner, they can be used to improve CALL resources for learners by enhancing the user experience and the learning outcomes. These technologies improved productivity in terms of CALL development. CALL researchers are encouraged to explore these technologies and use them where feasible in their own CALL resources. Future research will continue to explore and enhance the integration of these technologies in CALL to promote humanity, interactivity, and accessibility in language education.

 

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# Enhancing language learning for dyslexic learners: Integrating text-to-speech AI in CALL

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***Abstract***

*This paper presents the development and adaptation of the Cipher game, a digital language learning resource adapted for dyslexic learners using text-to-speech (TTS) Artificial Intelligence (AI) technology. Modifications to the original Irish Cipher game include simplified texts, adjusted game rules, and AI-generated audio for instructions, vocabulary, and sentences. These elements reduce cognitive load and enhance comprehension, aligning with the needs of dyslexic students. The TTS technology used produces clear, game-appropriate speech, facilitating a more engaging and supportive learning experience. This paper provides a comprehensive overview of the design and development process of the dyslexia-focused Cipher game. It highlights the potential benefits of incorporating advanced AI technologies in educational tools for learners with reading difficulties. Future research is necessary to empirically evaluate the efficacy of this tool in real-world settings, involving dyslexic learners in the testing phase. This paper contributes to the ongoing discourse on leveraging technology to promote inclusive education and support diverse learner needs in CALL environments.*

***Keywords:*** *CALL; text-to-speech; dyslexia; digital game-based language learning.*

## 1. Introduction

This paper delves into the integration of TTS AI in Computer-Assisted Language Learning (CALL) resources, specifically tailored for dyslexic learners. Focusing on the adaptation of the Irish CALL resource, Cipher: Faoi Gheasa (Xu et al, 2023), for an English context, our research explores the transformative potential of digital game-based language learning to address the unique challenges faced by dyslexic individuals in reading and language acquisition. In the field of CALL, by attending to specific language needs, our research emphasises the imperative of infusing humanity into the interaction between humans and computers for all learners in the classroom. By leveraging the innovative application of TTS AI technology, we aim to create an inclusive and engaging language learning environment for dyslexic learners.

 

## 2. Background

### 2.1. Dyslexia

Struggling readers is a term that is sometimes used to refer to those who encounter difficulties when trying to read text. However, this term looks at the deficit of the learner, rather than their abilities. For some people the term dyslexia means that language learning is problematic – dyslexia is about what learners cannot do and not what they can (Csizér et al., 2010; Eisenstein, 2010). Although more inclusive term is "those who need more support with reading", the terms dyslexia and dyslexic students will he used in this paper as they are more commonly used in the literature. Many readers who encounter difficulties with reading may be dyslexic, but there are many other potential causes of reading difficulties (Vellutino et al, 2004). Dyslexia is a learning disorder that involves issues with reading due to problems identifying speech sounds and learning how they relate to letters and words. Dyslexia is a spectrum and covers a range of reading abilities. Dyslexia is not related to intelligence and early interventions and support for dyslexic students can succeed in learning to read and write.

Reading is about understanding written texts and involves word recognition and comprehension. Pang et al (2003) note that early progress in reading depends on oral language development, that phonological and phonemic awareness are closely associated with reading ability and that vocabulary is crucial to reading comprehension. They report that readers make progress by reading more and that fluent readers read with accuracy, ease and understanding. People who can read, read for learning and for pleasure. However, for those who find reading difficult, they may find the process frustrating and miss out on learning opportunities. It is important to help learners to read so they can access information and knowledge held in the written word.

### 2.2. Dyslexia and CALL

Most of the CALL research is based on neurotypical adult English language learners (Ward, 2018). There is some focus on secondary school students (e.g. Macaro et al., 2012), but there is a limited focus on primary school learners (e.g. Ward, 2007). CALL research mainly focuses on L2 learners, but many CALL resources could also be helpful for L1 learners (e.g. dyslexic students). The term assistive technology in education is used to refer to the use of technology and tools to support learners. Assistive technology has been used to support dyslexic students in L1 reading and writing (Dawson et al., 2019). It is interesting to note that the first issue of Language Learning and Technology looked at language education and learning disabilities. (LeLoup, J. W., & Ponterio, 1997).

The pre-reader phase begins in infancy and will last until a child begins to actively learn to read. Researchers have reported on how technology can support pre-readers (Verwimp et al., 2023) and the importance of enjoyment for pre-readers (Vanden Bempt et al, 2022). Motivating and reaching all at-risk pre-readers to engage in reading programs can be achieved by making use of digital serious games. (Vanden Bempt, 2023). Vanden Bempt et al. (2021) note that technology can make a difference for pre-readers at cognitive risk for dyslexia (Dutch and Finnish). Beltrán et al. (2013) provide a good overview of inclusive language education and digital technologies (Beltrán et al., 2013) and Crombie (2013) reports on inclusive practice and technology in the dyslexia context. There are differing findings of the paper vs digital reading context with Støle et al. (2020) reporting that some students are better at reading on paper, while Schneps et al. (2013) note that e-readers can be helpful for those with dyslexia due to the short lines of text in e-readers. Overall there are indications of the benefit of digital technology in the dyslexia context, but more research is required (Bautista et al., 2023). Barzillai & Thomson (2018) advocate the need for a more nuanced understanding regarding the challenges and potential of digital environments and highlights the uniqueness of each child's digital reading experience. A is for App (Aisforapp, 2020) provides information on reading fluency apps for struggling readers in primary school. Liu et al. (2024) give an overview of the use of digital technologies to develop young children's language and literacy skills. Messer and Nash (2018) note the effectiveness of a computer-assisted reading intervention to address reading delays.

 

### 2.3. Orthographic transparency

Context is very important in language learning (Palfreyman, 2006). A core element of that is the language being studied. Language orthographic transparency has an impact on the ability of learners to read the language. Some languages are very transparent (e.g. Spanish and Finnish) and it is easy for learners to read and pronounce words in the language, even if they do not understand the words. A language like Dutch is slightly less transparent but learners can read the language with some guidance. Irish is less transparent than Dutch and it has unusual vowel (e.g. eadh which gives an 'a' sound) clusters and consonant clusters (e.g. bhf which gives a 'w' sound). English has an opaque orthography in which the relationships between letters and sounds are inconsistent with many exceptions, making English a significantly more challenging to the beginning reader than other more transparent alphabetic systems (Vellutino et al, 2004:17). Researchers have noted the impact of language orthographic transparency on reading and developmental dyslexia (Miles, 2000; Borleffs et al., 2019). According to Spenser (2000) there is evidence that English-speaking children who fail to acquire reading skills may fall into two distinct categories: those who would succeed in languages, other than English, that have greater orthographic consistency; and those who would still have problems even with perfect orthographic transparency.

### 2.4. Multidisciplinary CALL development

Often CALL research focuses on the impact of using off-the-shelf digital tools to enhance the language learning process (e.g. Messina Dahlberg & Bagga-Gupta, 2016). This is a sensible pragmatic approach as it means that others can learn how to effectively integrate available digital tools with their own students. Some of these digital tools are general digital tools (e.g. word processors and shared digital spaces), while others are designed with a pedagogical focus (e.g. Dizon, 2016). It is difficult to develop CALL resources from scratch as CALL development is challenging and requires a multidisciplinary team (Ward, 2015). Developing CALL resources for a specific cohort of learners is additionally challenging. There are often fewer tools available to help in the development process and there is a need to bring in additional expertise. For example, in the case of Less Commonly Taught Languages, there are fewer input resources available and it is difficult to find researchers with the necessary expertise to design and develop the CALL resource (Ward, 2007). In the case of L1 readers who need additional support, this means that the CALL development team needs the expertise of a dyslexia specialist, especially one who has experience in using, and is comfortable with digital tools. The dyslexia Cipher development team consists of a digital games expert, an Irish Natural Language Processing expert, a dyslexia expert and a CALL researcher.

### 2.5. Text-to-Speech

Text-to-Speech (TTS) tools convert digital text into audio. This can be helpful for language learning (Wood et al., 2018). In 2005, Handley (2005) noted that TTS tools were ready for use in CALL and TTS technologies have improved greatly since then. TTS can improve reading comprehension and word recognition and facilitate decoding (Keelor et al, 2020). It can also promote a more positive outlook on reading and increase time spent reading (Harvey et al, 2013). It can help students with disabilities stay at peer level in all of their subjects and improve self-esteem, motivation, and self-confidence. Diprossimo et al (2023) report on the benefits of vocabulary scaffolds for learners. However, using TTS tools and integrating them into reading support programmes can be challenging. Fälth and Selenius (2024) report that while teachers are supportive of the use of technology with their students, they lack awareness of what tools are available. Teachers need to acquire familiarity with the tools and how best to use them in order to have the self-confidence and competence to use the tools effectively with their students.

 

### 2.6. Cipher - A digital game based language learning app

The Cipher game, originally designed for Irish language learning, serves as the foundation for our adaptation to the English language. This digital game-based learning resource integrates vocabulary, reading, and writing components, rendering it a versatile and comprehensive platform for language acquisition tailored to learners of Irish. It is interesting to observe that the Cipher game for Irish was based on a game originally designed for English (Figure 1) (Xu & Chamberlain, 2020) and the current Cipher framework can now be used to develop resources for other languages and target-learner groups. Figure 2 shows the Irish version of Cipher for beginner learners of Irish, with a particular focus on primary school students (Xu et al., 2022). Note that the quantity and level of text is different between the original English version and the Irish version and the game vibe is also different.


Figure 1. Original English language version


Figure 2: Irish Cipher

## 3. Methodology

This project focuses on L1 English-speaking primary school children, specifically those in the 3rd grade, who are struggling readers and have dyslexia. These learners face unique challenges in language acquisition, necessitating tailored educational interventions that use advanced technology to support their needs. The primary objective of this research is to develop a tool to explore the potential of digital game-based language learning, particularly through the use of the Cipher game, in facilitating text, audio and image based language learning for dyslexic students. This project aims to explore the intersection of games and language acquisition, promoting a more inclusive approach in CALL.

 

### 3.1. Design features and approach

The Cipher game retains all the features of the Irish Cipher. However, this version of the Cipher game incorporates several key design features tailored specifically for this context. In order to focus on L1 English, young dyslexic students, the game content is tailored to meet the specific requirements of primary school children with dyslexia. There was also a need to make some modifications to the game rules. They are slightly adjusted to suit learners with dyslexia, ensuring the game remains accessible and supportive. With regards to TTS integration, the game employs TTS technology with an engaging voice to aid comprehension and pronunciation. The audio is carefully selected to match the game's magical theme, using a witchy and mysterious voice that is clear and slow, enhancing the gameplay experience.

### 3.2. Simplified game content

To adapt the Irish CALL resource for the needs of dyslexic learners, a comprehensive redesign of language learning materials, including vocabulary, reading materials, and sentences, was undertaken. The text in the game was simplified to ensure accessibility, achieving a Flesch Kincaid reading score of Grade level of 1.8 (indicating a reading level of Grade 1) and a Gunning Fog score, which estimates the years of formal education a person need to be able to read a text of 3.7 (indicuating that it is suitable for very young readers). This simplification was crucial to make the text suitable for young dyslexic learners. The adjustments to the game rules included changes to the quality of text and the storyline. The amount of text on each page of the story in the game was reduced to lower the cognitive load on learners. The storyline was rewritten to be appropriate for the target audience, maintaining the magical theme of the game. There were also changes to the magic spells. In the game, magic spells encode words in specific ways, creating patterns that learners can decode. Some examples of these magic spells include Bomb Switch (this spell jumbles the letters B, D, and P in a word), Hidden Harmony (this spell removes the 'h' from combinations like ch, th, or sh in a word and Silent Eva (this spell removes the silent 'e' in a word). These magic spells were designed based on common errors made by dyslexic learners, helping them recognise and correct these patterns in a fun and engaging way. Figure 3 shows the adapted version of Cipher for dyslexic learners. Note that there is less text but the game vibe has been maintained.


Figure 3: Adapted version of Cipher for dyslexic learners

### 3.3. Audio instructions using Text-to-Speech technology

Another adaptation is the use of simplified instructions and audio support. All text instructions in the game were checked, simplified and paired with AI-generated audio. Vocabulary words and their explanations in the

vocabulary also included AI-generated audio to reinforce learning through multiple modalities. Each sentence in the sentence writing part of the game also includes AI-generated audio, providing auditory support.

By incorporating these design elements and approaches, the Cipher game aims to provide a supportive and engaging learning environment for dyslexic students, enhancing their language skills through innovative digital game-based language learning. Table 1 provides a summary of the adaptations for dyslexic learners.

## 4. Discussion

Before the availability of TTS technologies, human voices were used to provide audio support for pronunciation of written words and text. While this is highly desirable in a CALL application, budget and time restrictions have frequently made this impractical. More recently, AI TTS technologies have enabled the provision of this audio support in CALL Liakin et al., 2017). When high quality AI TTS technologies are available for the langage being studied, it can result in a more efficient and reliable approach to audio support for learners. It should be noted that high quality AI TTS tools are not available for all languages, however they are available for the most commonly taught languages (e.g. English, French and Spanish).

In this research we use AI TTS technology to produce high-quality speech to support learners playing the Cipher game. In addition to pronunciation support, it provides them with guidance on how to play the game. This additional audio support can help dyslexic learners channel their cognitive resources in a more effective way. It can enable them to focus on active text-based learning targets within the game and reduce the cognitive load associated with interpreting textual d gameplay instructions. This is quite innovative in the CALL context, and we believe that the integration of AI TTS will prove to be a valuable tool in creating an accessible and supportive learning environment.

It is important to consider diverse learner needs when designing CALL resources r and the integration of advanced technologies, like AI TTS, can help in this regard. The Cipher game was designed to be an engaging and fun experience for players.. In classroom tests, learners who have played the Irish version of Cipher have reported that the game is fun and engaging. However, due to logistical constraints, it has not been possible to date to test this app with dyslexic students. In future research, we aim to assess the impact of the game modifications and additional audio support with this student cohort to investigate its effectiveness in making CALL applications more accessible to learners with special needs.

**Table 1:** Adaptations for Dyslexic Learners

| Feature | Change | Motivation |
|---|---|---|
| Target language | L1 young dyslexic students | Language must be at an appropriate level |
| Audio | Addition of TTS audio to the game | To enhance comprehension and aid pronunciation |
| Game rules | Adjusted for dyslexic students | Keep the game accessible and supportive |
| Quantity of text | Less text | Lower cognitive load on students |
| Storyline | Rewritten for target audience | Ensure storyline is relevant for students |
| Magic spells | Adapted to cover specific difficulties for | Help students with decoding |

 

| | | |
|---|---|---|
| | dyslexic learners (e.g Bomb Switch, Hidden Harmony, Silent Eva) | |
| Instructions and audio support | Simplified instructions and additional audio support are provided | Keep game accessible and provide additional support |

## 5. Conclusion

The aim of this project was to develop a version of the Cipher game with additional audio support for learners, particularly those with additional needs, including learners with dyslexia. Audio files can provide useful support for all learners, irrespective of whether they have a learning difficulty or not. These additional supports in Cipher include audio files for pronunciation as well as audio files for the instructions of how to play the game. In this application, AI TTS technology was used to generate the English language audio files for the game. This facilitated the efficient production of high-quality, clear, game-appropriate speech providing an engaging and supportive learning experience. It would not have been possible to produce these audio files to the same quality, consistency and low cost in such a short time frame without the use of AI. . Further research is necessary to empirically evaluate the efficacy of this tool in real-world settings, involving dyslexic learners in the testing phase. This paper outlines how technology can be leveraged to promote inclusive education and support diverse learner needs in CALL environments and CALL researchers are encouraged to consider the use of this technology in the development of their own CALL resources.

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# Evaluating the impact of the ELSA app on Japanese students' focus on pronunciation and motivation

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***Abstract***

*This study investigated the effectiveness of the English Language Speech Assistant (ELSA) app in increasing Japanese university students' attention to English pronunciation, as well as their interest in and motivation for ongoing autonomous learning. With the rise of personalized artificial intelligence tools and the ubiquity of mobile devices, mobile-based High Variability Phonetic Training has emerged as a promising method to assist learners in improving their English pronunciation. This study involved first-year university students in Japan, who used the ELSA mobile app in class over a seven-week period. In addition to practicing various English sounds with the app, students created two-minute videos and took initial and final self-assessment tests provided by the app, which evaluated a comprehensive range of pronunciation aspects, including segment pronunciation, intonation, and fluency. After completing the post-ELSA video assignment and assessment test, students reflected on their pronunciation improvements by comparing their videos. A survey was conducted to evaluate students' perceptions of the app. The findings indicate that the ELSA app has the potential to help focus on and encourage practice among English language learners, though its impact on fostering autonomy and confidence needs further exploration.*

***Keywords:*** *English Language Speech Assistant (ELSA); pronunciation; attention; High Variability Phonetic Training (HVPT).*

## 1. Introduction

Learning L2 sounds for listening and production can be challenging. Attention to L2 sounds, combined with the quantity and quality of input, is crucial for reducing accentedness in second language learners (Thomson, 2012). In class, learners are exposed to L2 sounds through audio from textbooks and instructors. Although modern textbooks often utilize a variety of voices, enabled by advancements in AI technology, the range of L2 sounds remains somewhat limited. There is a technique called High Variability Phonetic Training (HVPT), originally developed by Logan, Lively and Pisoni in 1991, that improves language learners' pronunciation skills by exposing them to a wide range of speech sounds from multiple speakers in various contexts to enhance their ability to recognize and produce the sounds accurately (Barriuso & Hayes-Harb, 2018; Thomson, 2012). A substantial body of research suggests that HVPT significantly impacts learners' perception of L2 sounds and improves their ability to produce these sounds by presenting them with a variety of L2 sounds from different speakers (Barriuso & Hayes-Harb, 2018; Brekelmans et al., 2022; Iino & Wistner, 2022; Saleh Mahdi & Mohsen, 2023). Since HVPT has proven effective in laboratory settings for enhancing listening and speech abilities, it is crucial to demonstrate

 

how this method could be applied in everyday classroom settings (Barriuso & Hayes-Harb, 2018). Acquiring L2 sounds without proper instruction and training can be difficult, and limited exposure time to L2 is a common issue for learners of English as a Foreign Language in school settings. For example, at the science university in Yamaguchi, students have three year-long required English courses, but two of them are reading courses with Japanese teachers of English. The other is a speaking course that may or may not be taught by a native speaker of English. There is simply not enough class time devoted solely to listening to or learning English sounds. Thus, more apps that foment autonomy in learners are needed. In recent years, with technological advancements, a vast array of web-based pronunciation tools and mobile apps that provide feedback using automatic speech recognition systems have become widely available (Fouz-Gonzalez, 2020; Rogerson-Revell, 2021). Utilizing the ubiquity of mobile devices, these tools have made it possible to extend additional practice on L2 sounds outside of class time, and to foster independent learning habits as exercises are available anytime and anywhere. The English Language Speech Assistant (ELSA) app is one such tool, applying AI to deliver personalized feedback and HVPT through multiple voices (Becker & Edalatishams, 2019; Darsih et al., 2021; Sarmita Samad & Aminullah, 2019). Positive outcomes and perceptions about ELSA have been documented in numerous studies (Darsih et al., 2021; Sarmita Samad & Aminullah, 2019; Sholekhah & Fakhrurriana, 2023), yet research involving large numbers of participants at Japanese universities has not been reported. Furthermore, studies investigating whether AI-assisted pronunciation apps can promote learners' awareness of L2 pronunciation are limited (Chujo, 2021). To address these gaps, the following research questions (RQs) are proposed:

RQ1: Can the ELSA app heighten learners' focus on English pronunciation when they speak?

RQ2: Can the ELSA app enhance learners' motivation towards improving their English pronunciation?

RQ3: Can the ELSA app promote learner autonomy?

## 2. Method

### 2.1. Context and participants

The participants in this study were 109 first-year Japanese students at two universities in Japan, all approximately at the CEFR A2 level, and enrolled in compulsory English courses. About 80% of the participants were enrolled in various science-related faculties such as engineering and data science. The remaining participants were from the Faculty of International Liberal Arts, Business Administration, or Nursing.

### 2.2. Procedure

The students practiced various English sounds using the ELSA mobile app once a week in class over a seven-week period. For this study, a free version of the app was used, which offers limited lesson selections and allows users to engage with five lessons each day. Due to these limitations, specific sounds such as /θ/, /ð/, and /æ/, as well as sound pairs such as /r/ and /l/ or /v/ and /b/, were designated for practice each week. Sometimes it was beginning sounds, ending sounds, different vowels, minimal pairs, and much more. It was not feasible to require the students to purchase the full ELSA Speak app. However, within the free version, students still could access tutorial videos as well as do AI-assessed speaking activities with instant feedback.

### 2.3. Data collection

Prior to using the app, participants created a two-minute video and took a 10-minute assessment provided by the app. During this test, participants read the provided sentences aloud, and the app evaluated their segmental features of pronunciation, intonation, and fluency, and it provided an average score for these three components. The app exercises involved reading aloud single words, phrases, and complete sentences, after which the app assessed the sounds and provided immediate feedback. The exercises also included listening tasks, such as differentiating similar sounds. Each class session dedicated 10-15 minutes to the app usage after a brief introduction of the selected sounds.

 

After completing the seven-week series of ELSA exercises, participants created another short video and completed another assessment test using the app. They then reflected on their pronunciation improvements by comparing their initial and final videos. Students used another online software (Flip) to upload their videos and make comments on videos before, and so it was decided that this would be a good way to gather their opinions. A survey, conducted in English at the end of the period, was used to evaluate their opinions on the app. The survey consisted of 13 items in a five-point Likert scale format, ranging from one (Strongly disagree) to five (Strongly agree), allowing for quantitative measurement of attitudes towards the app's use and effectiveness. Most of the previous literature on similar surveys utilized five-point Likert scales, and to maintain uniformity, the same approach was adopted for this survey. Five additional questions in various formats, such as agree/disagree and free response, were included to gather further data, but did not pertain to this study.

To assess the effectiveness of the ELSA app in enhancing students' focus on and engagement with English pronunciation, as well as their motivation for continuous independent learning, the initial seven questionnaire items were thoroughly analyzed to address the three research questions. Statements 1 and 2 aimed to analyze whether the app enhances students' perceptions of their pronunciation. Statements 3, 4, and 5 assessed how engaged students were in improving their pronunciation skills through the app. Statements 6 and 7 aimed to determine the app's potential to foster independent learners, with Statement 7 specifically seeking to determine if having more control over the app's accessibility would alter students' perceptions of autonomy.

Statements 8 through 13 were not directly aimed at addressing the three research questions; however, they provided valuable insights for us in deciding whether to continue using the app in the future. Statements 8 and 9 asked participants about how well they felt the app evaluated their English sounds. Statements 10 and 11 gave a view of the overall impression of the students toward the app and its ties to the learners' emotions when using the app and speaking English. Statements 12 and 13 explored learners' willingness to use English in conversations with others, which further highlighted aspects of communication confidence and social interaction.

## 3. Results

A total of 102 participants completed both the pre- and post-ELSA self-assessment tests. The pre-ELSA test showed an average score of 46%, while the post-test exhibited an average of 49%. This revealed a relatively modest increase of 3% after seven weeks of intermittent practice.

The final survey was completed by 109 participants. Table 1 presents the results (means and standard deviations) for the 13 question items on the five-point Likert scales. Except for Statement 6, students agreed with all other statements. To investigate the effectiveness of the ELSA app in increasing students' attention to and interest in English pronunciation, as well as their motivation for ongoing autonomous learning, the first seven question items were closely examined and depicted in the Likert scale chart shown in Figure 1.

**Table 1**. Survey statements and results.

| No. | Statement | (n= 109) | |
|---|---|---|---|
| | | M | SD |
| 1 | I pay more attention to English pronunciation whenever I speak English because of using ELSA app. | 3.7 | 0.91 |
| 2 | I believe that the ELSA app assisted me in improving my pronunciation. | 3.9 | 0.88 |
| 3 | The app practice encouraged me to practice/improve my English pronunciation. | 3.8 | 0.89 |
| 4 | The assessment test results encouraged me to practice/improve my English pronunciation. | 3.5 | 1.03 |

 

| | | | |
|---|---|---|---|
| 5 | I recommend regularly using this app in class. | 3.8 | 0.85 |
| 6 | I will likely continue using the app on my own. | 3.2 | 0.98 |
| 7 | I would continue using the app on my own if there were more practices in the free version. | 3.6 | 0.91 |
| 8 | The app accurately evaluates my English sounds. | 3.7 | 0.88 |
| 9 | The assessment test accurately evaluates my English sounds. | 3.6 | 0.99 |
| 10 | I feel excited when I learn English with the ELSA app. | 3.7 | 0.84 |
| 11 | I do not get anxious when I learn English speaking skills and pronunciation with the ELSA app. | 3.5 | 0.85 |
| 12 | The ELSA app has given me confidence to speak English. | 3.5 | 0.80 |
| 13 | Learning through the ELSA app encourages me to converse with others in English. | 3.4 | 0.87 |

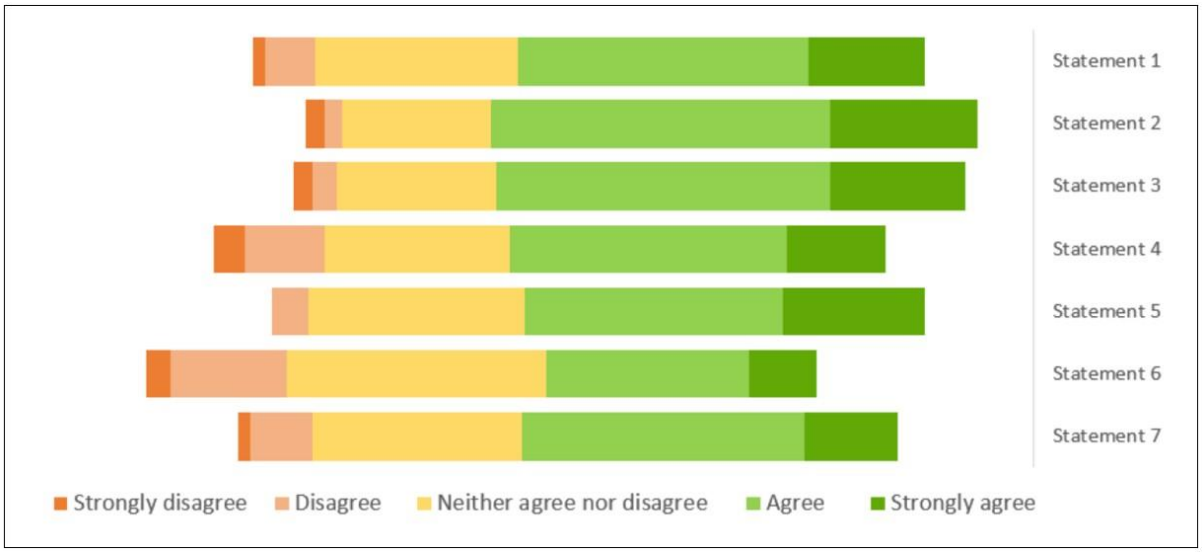


Figure 1. Likert Scale Chart: Statement 1 through Statement 7.

Responses to Statement 1, which explored how conscious students were of their pronunciation when speaking English, indicated that they became more attentive to their English pronunciation. Data from Statement 2 reflected students' perceptions of their ability to recognize improvements in their English pronunciation, including differences between their initial recordings at the start of the term and those made three months later. The results suggest that students agreed the app heightened their attention to pronunciation.

Although responses to Statements 3 and 4, which inquired whether the app boosted their motivation to advance their pronunciation skills, were categorized as "Agree", there were noticeable differences between the app practices and the assessment tests. Statement 5 aimed to gauge students' approval of using the app in subsequent terms or other English classes. Responses generally agreed on the continuous use of the app in class, and there were no "Strongly disagree" responses for this statement.

The mean value for Statement 6 indicated that students held a neutral position regarding autonomous learning initiatives. Responses to Statement 7 show that 57% of participants either "Strongly agree" or "Agree," which suggests a slightly positive reception to increased control over the app's accessibility.

 

The results from Statements 8 and 9 show that students felt somewhat more comfortable with the exercises within the app but less so with the assessment test. In fact, two students took the final assessment test twice because they forgot to take a screenshot as proof. The scores were close in both cases but not identical. Responses to Statements 10 and 11 reflected the emotional state of the participants, with excitement while using the app indicating motivation to use the app. Additionally, most learners did not experience anxiety when using the app, although approximately 10% of responses were on the negative side. The results from the last two statements both revealed that about half of the participants selected “Strongly agree” or “Agree.”

## 4. Discussion

Statements 1 and 2 were included to analyze the app’s potential to enhance students’ perceptions of their pronunciation. Although the data in both statements are in the range of “Agree”, visible differences can be seen in Figure 1. Responses to Statement 2 included significantly fewer “Disagree” and “Neither agree nor disagree” responses compared to Statement 1. While 60.5% of participants now pay more attention to pronunciation in speech, 72.4% of participants noticed improvement in their pronunciation. Based on these findings, it is possible that participants are subconsciously paying more attention to their English pronunciation whenever they speak; however, this hypothesis also requires further investigation.

The intent of Statements 3 and 4 was to examine the potential impact of the app in encouraging participants to practice pronunciation further. Responses to Statement 3 showed a relatively positive outcome in the use of various exercises within the app. In contrast, the variation in responses for Statement 4 was more noticeable. The percentage of “Disagree” responses significantly increased, while the percentages of “Agree” and “Strongly agree” notably decreased. Additionally, a standard deviation of 1.03 indicates high variability in responses. Further inquiry into reasons for these responses would be insightful. Furthermore, since Statement 4 pertains to the value of the assessment, it is logical to consider the responses from Statement 9, which directly asked participants to evaluate the app’s assessment test. The data from both statements show only slight differences, suggesting that disapproval of the assessment test evaluation may directly affect participants’ motivation for further pronunciation training. This raises the question: Did participants’ satisfaction with the app exercises apply uniformly across all types of drills, or was there greater emphasis on the listening components? The variations in responses to Statement 5 were characterized by a smaller percentage of “Disagree” and the absence of “Strongly disagree”. Although the “Neither agree nor disagree” category was comparatively larger, it is reasonable to conclude that participants were generally supportive of using the app in class in the future.

Promoting autonomy is a crucial aspect of the learning process in any field, particularly due to the limited time available to conduct extensive exercises in class. Statement 6 aimed to examine whether the app could serve this purpose. Despite observing a neutral overall result, the shift of the response bar to the left and a noticeable reduction in the ”Agree” category were clearly evident in Figure 1. This outcome was unexpected and raised questions about which aspects of the app might demotivate participants from using it outside class time. A possible answer emerged from the responses to Statement 7, where an increased number of participants agreed to use the app independently if more practice opportunities were available. This suggests that the app exercises were not demotivating in themselves; rather, motivation was hindered by the limitations of the exercises in the free version. The mean response of 3.6 in Statement 7 appears relatively modest, and other factors must be considered to understand the reasons behind the mean response of 3.2 in Statement 6. Therefore, it is premature to conclude that the app failed to foster autonomous learning. Further investgation surrounding which exercises in ELSA the learners enjoy doing and deem valuable needs to be done. Additionally, in Statement 11, indications were the students did not get anxious when using the app for learning English, but a quesiton comparing using the app and normal classroom learning might be informative. Similarly, Statements 12 and 13 point favorably to use of the ELSA app, but more in-depth questions surrounding which exercises led to these responses might prove helpful.

 

## 5. Conclusions

The current study was designed to assess whether the ELSA app, which utilizes a combination of AI technology and High Variability Phonetic Training, increases students' attention to their own pronunciation. Additionally, the study aimed to explore the potential of the app to heighten motivation for improving pronunciation among Japanese students and to foster autonomous learning habits. The analysis aimed to determine whether the app helped learners focus more on English sounds and their own pronunciation (RQ1). The responses suggested that the app may have contributed to learners paying more attention to their own pronunciation. Given the technological advancements and the wide availability of apps, it is significant to assess whether the app encourages learners to practice further to improve their pronunciation. Although learners presented a slightly unfavorable view of the app's assessment test performance, the exercises within the app received positive feedback. Additionally, learners expressed approval for the continuous use of the app in class. Thus, it is suggested that the app holds potential to be a valuable technology that attracts learners' interest and motivation (RQ2). Finally, determining the app's capability to promote autonomous learning (RQ3) was challenging, but it certainly raised questions for further investigation regarding which aspects of the app spark learners' motivation to work independently. In conclusion, while additional studies are necessary to explore the depth of the ELSA app's effects, it still appears to hold potential to assist learners in advancing their pronunciation and prompting them to become independent learners. A longer (than 7 weeks) case study, and/or one using the paid version of the app could help provide more insight as well. We also do not know if the small increase in the ELSA assessment test scores were either significant or long-lasting. ELSA Speak is a relatively young app that is receiving good reviews, and with each new study, more questions regarding its utility arise.

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# Generative AI as a tool for enhancing English Medium Instruction

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***Abstract***

*The paper explores the integration of AI in English Medium Instruction (EMI) to enhance learning experiences. Despite the benefits, EMI faces several challenges, including insufficient preparation time for educators, limited collaboration between content and language specialists, fluctuating student numbers, and a lack of experienced EMI instructors. Preliminary research conducted in Japan (Kikuchi, 2024) indicated that AI integration in EMI courses correlates positively with English proficiency and academic performance, but gaps remain in understanding specific AI usage patterns and effective management by EMI teachers. Building on these findings, this study employs semi-structured interviews to delve deeper into students' AI usage and teachers' perceptions across varied EMI courses of AI tools. Unlike the preliminary study, where participants were encouraged to use AI tools within group activities, this study involves students who have had different EMI courses and teachers from diverse EMI specialties. This study reveals mixed perceptions of AI usage among students and teachers. While AI is valued for routine tasks, its transformative potential remains underutilized due to concerns about reliability and academic integrity. Addressing these challenges requires clear guidelines, training for AI use, and innovative assessment methods focusing on higher-order thinking and creativity. The study concludes with strategic implications and directions for future research to optimally integrate AI into EMI settings.*

***Keywords:*** *EMI; AI; qualitative study; higher education.*

## 1. Introduction

### 1.1. Background

In the 21st century, English has emerged as the lingua franca of education, prompting a global rise in English Medium Instruction (EMI), notably in Japan and other EFL (English as a foreign language) countries (Brown, 2016; Doiz et al., 2013). EMI is defined as "the use of the English language to teach academic subjects (other than English itself) in countries or jurisdictions where the first language of the majority of the population is not English" (Macaro et al., 2018, p. 37). While the primary aim of EMI is to deliver academic content, it inherently involves extensive use of the English language, which can also lead to incidental English language development among students. This secondary benefit, although not the main focus of EMI, plays a crucial role in enhancing students' comprehensive academic experience by improving their English proficiency as they engage with subject matter.

This movement was initially propelled by the Bologna Process in 1999, a key initiative under the European Region Action Scheme for the Mobility of University Students (Erasmus), which aimed to enhance student mobility and foster international collaboration (Kirkpatrick, 2014). These European models, while successful, are rooted in a context where geographical proximity and dense networks of diverse languages encourage a fluid exchange of students and ideas across borders. This environment significantly reduces the logistical and financial barriers associated with adopting EMI.

Similarly, the implementation of EMI was driven by government initiatives and quasi-market policies aimed at enhancing mutual growth and exchange with other countries in Japanese higher education (Hashimoto, 2018; Tsuruta, 2006). According to the latest data from MEXT (the Ministry of Education, Culture, Sports, Science and Technology, 2023), 41% of universities in Japan offered EMI courses in 2021, up from 26% in 2007. However, growth has stagnated since 2017 (MEXT, 2023).

The implementation of EMI in Japan faces several challenges, including the lack of geographical proximity to other countries and the predominance of monolingualism. Widespread issues include limited preparation time for educators to teach content in English (Lasagabaster, 2022), insufficient collaboration between content and language specialists (McKinley & Rose, 2022), fluctuating student numbers (Tang, 2020), and a serious shortage of EMI instructors with the necessary expertise and experience (Galloway & Ruegg, 2022). The balance between English language skills and academic content is further complicated by the diverse needs of students (Nguyen et al., 2023) and by the impact on final academic outcomes (Zhou et al., 2023).

This study aims to examine how AI can address challenges in EMI. Russell and Norvig (2020) define AI as "the study of agents that receive percepts from the environment and perform actions" (p. vii). In educational contexts, AI can be used to customize learning experiences, tailoring them to the individual needs of students. In a preliminary investigation, Kikuchi (2024) administered a questionnaire about AI to 142 students in an EMI course, where students were encouraged to use AI tools during two group activities. The questionnaire explored the extent of AI integration within the class and examined its relationship with students' English proficiency and final grades. This research employed ANCOVA to analyze the influence of English proficiency, categorized into three levels, and AI integration levels on students' final grades. Before conducting the ANCOVA, the questionnaire data were tested for normality, and *z*-scores confirmed that the distribution met the necessary assumptions. The analysis revealed a statistically significant relationship, with an *F*-value of 5.253 ($p = 0.006$) and a moderate effect size ($\eta^2 = 0.071$). Conversely, the intercept of the model indicated a substantial baseline level of AI integration, independent of English proficiency, with an *F*-value of 31.733 ($p < .001$) and a large effect size ($\eta^2$=0.187). Furthermore, the covariate, the EMI course final grades, significantly influenced AI usage, $F(1, 138) = 65.705$, $p < 0.001$, with the large effect size ($\eta^2$=0.323), suggesting that academic performance is strongly related to how students integrate AI into their learning. The model explained a significant proportion of the variance in AI integration levels, demonstrating the combined effects of English proficiency and academic performance. The key takeaway here seems to be that while all students might be using AI tools to some extent, independent of their English skills, the benefit they gain and the depth of their engagement with AI in their learning likely depend on their academic prowess and English proficiency. This could mean that while AI tools are accessible to all students, those with better academic skills or higher English proficiency are perhaps better positioned to capitalize on the potential of AI to enhance their learning outcomes.

However, the specific ways in which students and teachers use and integrate AI tools in EMI courses, where such use may not be explicitly encouraged or structured, remain unclear. This lack of clarity highlights the need for a deeper understanding of the practical applications and perceptions of AI in EMI contexts. To address these gaps, the current study employs qualitative interviews with both students and teachers. This approach aims to explore how various factors influence the use and integration of AI tools and how these factors affect educational outcomes, striving to uncover the broader educational strategies involved.

### 1.2. Conceptual framework

To frame this exploration within AI tools, the study utilizes the SAMR model (Puentedura, 2010) and SWOT analysis. The SAMR model categorizes technological integration into four levels:

- *Substitution*: AI tools replace traditional methods with no significant change (e.g., using AI for grammar checking instead of manual correction).
- *Augmentation*: AI tools provide functional improvements to traditional methods (e.g., using AI to provide instant feedback on writing tasks).
- *Modification*: AI allows for significant redesign of tasks (e.g., using AI for collaborative projects that were not feasible before).
- *Redefinition*: AI enables the creation of new tasks that were previously inconceivable (e.g., using AI to create interactive, personalized learning experiences).

In addition to the SAMR model, this study employs a SWOT analysis to evaluate the strengths, weaknesses, opportunities, and threats associated with integrating AI into EMI. Strengths and weaknesses focus on internal factors, while opportunities and threats consider external factors.

- *Strengths*: Enhanced student engagement and accessibility to diverse resources.
- *Weaknesses*: Potential issues such as plagiarism and the need for extensive teacher training.
- *Opportunities*: Growth in interactive learning tools and improved teacher collaboration.
- *Threats*: Risks like the digital divide and ethical concerns related to AI use.

### 1.3. Research questions

Guided by the SAMR model and informed by a SWOT analysis, this study formulates two research questions to explore the integration of AI in EMI courses.

1. How do students perceive the impact of AI on educational outcomes in EMI courses?
2. What challenges and strategies do teachers identify for integrating AI into EMI settings?

These questions aim to uncover the key factors influencing AI integration that may lead to improved educational outcomes, as perceived by both students and teachers.

## 2. Method

### 2.1. Context and participants

The study was conducted in early 2024, involving participants from three universities in Kanto area of Japan. The participant group included 32 senior Japanese students who had completed at least one EMI course in early 2023, with some having taken an EMI course where the instructor actively encouraged the use of AI tools. The study also involved seven university teachers, each with experience in teaching one or more EMI courses across several universities in Japan and a demonstrated interest in integrating AI into their instructional practices.

### 2.2. Data collection

Data collection was conducted in English and Japanese using semi-structured interviews via the Zoom platform. The average interview duration for students was 10.3 minutes (Mean: 10.3; SD: 3.3; Min: 8; Max: 15), while for teachers it was 22.7 minutes (Mean: 22.7; SD: 2.1; Min: 18; Max: 26). These durations provided time to explore in-depth the experiences and views of both student and teacher participants regarding the potential and actual integration of AI in EMI settings. The interview questions were provided to participants in advance, ensuring that the allocated time was sufficient for meaningful discussion.

For Students: (1) How do you use AI in your EMI classes? (2) In what ways has AI been beneficial for your learning in EMI classes? (3) What challenges have you encountered when using AI in your EMI classes?

For Teachers: (1) How is or will AI be integrated into your EMI class? (2) In what ways is or will AI be beneficial for your teaching in EMI classes? (3) What challenges do or will you encounter when integrating AI into your EMI classes?

### 2.3. Data analysis

The interview data were transcribed verbatim, converting the audio recordings into written text. This transcription process was essential for facilitating thorough analysis. Given that the interviews were conducted in both English and Japanese, a systematic translation process was implemented to ensure accuracy and consistency. Interviews conducted in Japanese parts were first transcribed in Japanese. These transcriptions were then translated into English by a bilingual translator. To ensure accuracy, a back-translation method was employed where a different translator translated the English text back into Japanese. Discrepancies were reviewed and resolved through discussion between the translators and the researcher.

The data analysis employed a thematic analysis approach, integrating both inductive and deductive methods (Swain, 2018), by using Nvivo 14. Initially, an inductive approach was used to allow themes to emerge directly from the data without being constrained by pre-existing theories. This approach was critical for capturing the nuanced experiences and perspectives of students and teachers regarding AI in EMI settings.

To visualize the key themes, Word Clouds were generated from the transcriptions. These Word Clouds provided a preliminary overview of the most frequently mentioned terms by students and teachers, highlighting key areas of focus in their responses.

Subsequently, a deductive thematic analysis was conducted using the SAMR model for students and SWOT analysis for teachers, as outlined in the Introduction. The SAMR model was chosen for student data as it effectively categorizes the levels of technology integration in their learning activities, highlighting how AI tools enhance and transform their educational experiences. The SWOT analysis was applied to teacher data to provide a comprehensive evaluation of the strategic factors influencing their perceptions and management of AI tools in EMI settings. Thematic coding was employed to identify recurring patterns and themes, which were then mapped onto these frameworks.

## 3. Results

Word Clouds (Figure 3.1. and Figure 3.2.) were generated by Nvivo 14 to visualize the key themes and terms mentioned by the participants.


Figure 3.1. Word Cloud of Students' Responses. Figure 3.2. Word Cloud of Teachers' Responses.

### 3.1. SAMR analysis of students' data

Figure 3.1. shows the Word Cloud generated from students' responses. Prominent terms include "English," "use," "think," and "class" indicating that these were common themes in the discussions about AI in EMI classes. The word "useful" suggests that students frequently evaluated the effectiveness of various tools and methods, including ChatGPT, which was specifically mentioned.

The SAMR model was used to categorize the levels of technology integration observed in student responses. This model helps to understand how AI tools are utilized to enhance and transform learning experiences. This analysis revealed that students primarily utilized AI tools at the Substitution and Augmentation levels, with few instances observed at the Modification or Redefinition levels. Additionally, thematic codes such as "Challenges and concerns" and "General use and perceptions" were identified to further explore students' experiences and attitudes towards AI use in their learning environment.

#### *3.1.1. Thematic classifications and number of occurrences*

- Substitution (Code)
  - Grammar and spell-checking (Sub-code, 15 occurrences) "*I always use Grammarly to check my essays before submitting them, because my teacher in America asked me to do so*." "*I use it to translate English sentences that are difficult to read*." "*I use it to make my writing more accurate.*"
  - Basic vocabulary reinforcement (Sub-code, 5 occurrences) "*I use Quizlet to memorize new English vocabulary used in EMI classes, although I am not sure whether Quizlet is part of AI or not*."

- Augmentation (Code)
  - Immediate feedback and writing improvement (Sub-code, 12 occurrences) "*Using AI for immediate feedback has helped me improve my writing skills quickly*." "*It is useful because it corrects grammar and the way I say things, but if the English is too clean, it is embarrassing because it feels like it wasn't written by me. I don't feel comfortable submitting it as a report because it is related to my grade*."
  - Translation and summarization (Sub-code, 8 occurrences) "*I use ChatGPT for assignments where I have to read a long document and summarize it, or when I have to solve a math problem in economics that I don't understand*." "*I often use DeepL to check my Japanese into English or my English. I always check my reports before submitting them. It is useful because it makes the phrases better than my own and corrects the words. I can't help but use it*."

- Modification (Code)
  - Interactive quiz generation (Sub-code, 2 occurrences) "*I ask ChatGPT to create quizzes about what I have not mastered. Thanks to these, I found what I did not know and must study*."
  - Job application and interview preparation (Sub-code, 4 occurrences) "*I ask ChatGPT to help me think about questions a potential employer might ask and how to respond to them effectively*." "*I use ChatGPT to articulate what I have achieved and experienced during my university life, enhancing my job applications*."

- Redefinition (Code)
  - Exam preparation (Sub-code, 2 occurrences) "*I ask AI to create quizzes and I try them as exam preparations*."

- Challenges and concerns (Code)

- Accuracy and reliability (Sub-code, 6 occurrences) "*ChatGPT3.5 is unreliable information. After all, you have to look it up by yourself, and you can't use it as it is in your report*." "*I have concerns about the accuracy of the content presented by ChatGPT*."
- Learning and skill development (Sub-code, 5 occurrences) "*I used it in class, but in the end, I learned more by doing a lot of research and writing on my own, and it is easier to do the opposite*."
- Concerns about cheating (Sub-code, 10 occurrences) "*I feel AI use sounds like cheating and somehow avoid using AI because I am scared that my teacher will find it and get angry at me*." "*I use Grammarly to write my assignments. But the English is too good to be mine. So I always try to intentionally make them worse or include some grammatical mistakes.*"

- Concerns about over-reliance (Sub-code, 7 occurrences) "*I feel that once I get used to it, I can't help but use it, and I don't think my ability will grow*." "*I don't think that using it too much is good for me. I am a little doubtful that using this will help me study or improve my English*."

- General use and perceptions (Code)

- Practicality and accessibility (Sub-code, 3 occurrences) "*I often use Google-related Docs and Google Forms. I don't know which one is AI, and in the end, I feel comfortable using something that is free, that I know how to use, and that I can use in my daily life, not in a class*."
- Everyday utility and ease (Sub-code, 4 occurrences) "I *ask ChatGPT about restaurants I should go to for my friend's birthday*." "*ChatGPT's recommendation on where to take my girlfriend is helpful because I have no idea about it myself*." "I ask ChatGPT to help me think about questions a potential employer might ask and how to respond to them effectively." "I use ChatGPT to articulate what I have achieved and experienced during my university life, enhancing my job applications."

Six distinct codes were identified regarding the use of AI tools among students. Across the four categories of the SAMR model, their AI use rarely extended to Modification and Redefinition. While AI provides significant benefits in terms of grammar correction, instant feedback, and language translation, students also expressed concerns about over-reliance, accuracy, and the potential for perceived cheating. There appears to be a spectrum of opinions between those who find these tools beneficial for their learning and daily lives and those who are concerned about their impact on developing independent skills. Notably, some students expressed uncertainty about what constitutes AI, highlighting the diversity in understanding that is critical to consider in this analysis of the interview data.

### 3.2. SWOT analysis of teachers' data

While general terms such as "student," "use," and "classes" were frequently mentioned, notable words like "grading," "human," "integrated," and "incorporating" highlight specific themes in the discussions about AI in EMI classes. The analysis using the SWOT framework reveals insights into the strengths, weaknesses, opportunities, and threats related to the integration of AI from the teachers' perspectives.

#### *3.2.1. Thematic classifications and number of occurrences*

- Strengths (Code)

Time-saving in material preparation (Sub-code, 4 occurrences)

- Teacher 1 (Subject: Bible in English) "*I would like to try to make good use of AI to handle translation and assignment creation.*"
  Teacher 3 (Subject: Microeconomics) "*AI has helped me to create quizzes and cover the basics of syllabus preparation*."

- Teacher 7 (Subject: International Relations) "*AI can assist when native English-speaking students are not available to help*."

Individual student support (Sub-code, 7 occurrences)

- Teacher 1 (Subject: Bible in English) "*AI can answer individual questions well, especially with varying native English-speaking student numbers*."
- Teacher 2 (Subject: American Studies) "*AI supports checking assignments that are difficult to understand in English*."
- Teacher 6 (Subject: International Relations) "*Using AI can help students who struggle with English, allowing teachers to avoid teaching English itself*."

- Weaknesses (Code)

Non-verbal communication (Sub-code, 6 occurrences)

- Teacher 2 (Subject: American Studies) "*AI supports checking assignments, but cannot handle non-verbal communication such as gestures and facial expressions, which are crucial in teaching*."
- Teacher 7 (Subject: International Relations): "*Challenges include deciding how AI should be used and its purposes. It's crucial for teachers to observe students' facial expressions, gestures, and group dynamics in class, elements that AI currently cannot replicate.*"

Human-AI interaction (Sub-code, 6 occurrences)

- Teacher 1 (Subject: Bible in English) "*AI can answer individual questions well, but there is a risk that students may mistake AI interactions for human ones, affecting their expectations from human teachers. Students might expect too much from AI and rely less on teachers*."
- Teacher 7 (Subject: International Relations) "*AI can assist in teaching when native speakers are unavailable. But students around the age of 20 need more than just teaching elements. They require engagement with sensitive feelings and culture, which AI currently cannot provide."*

Grading challenges (Sub-code, 7 occurrences)

- Teacher 1 (Subject: Bible in English) "*Grading and security aspects of AI are challenging. Students might mistake AI for human interaction*."
- Teacher 2 (Subject: American Studies) "*There is no way to properly check the reports submitted by students to see to what extent they are their own work. I am also worried that ChatGPT might give my students answers that differ from what I teach*."
- Teacher 3 (Subject: Microeconomics) "*Grading is a challenge, especially determining the extent of AI use by students*."
- Teacher 4 (Subject: Physics and Mathematics) "*We need to figure out how to grade students without reflecting AI skills*."
- Teacher 5 (Subject: History of Media) "*Grading students becomes difficult when differentiating between those who use AI and those who do not*."

- Opportunities (Code)

Enabled to focus on content (Sub-code, 10 occurrences)

- Teacher 5 (Subject: History of Media) "*AI helps students improve English skills without turning the class into an English class*."
- Teacher 6 (Subject: International Relations) "*AI can help students who stumble in English, allowing teachers to focus on content*."

Improved quality of learning materials (Sub-code, 6 occurrences)

- Teacher 2 (Subject: American Studies) "*We use AI to check the materials we distribute to students*."

- Teacher 4 (Subject: Physics and Mathematics) "*AI's English support and learning materials can help teachers develop better class content*."
  Teacher 5 (Subject: History of Media) "*AI can help students overcome one hurdle in their English proficiency by immediate translation*."

- Threats (Code)

Over-reliance on AI (Sub-code, 9 occurrences)

- Teacher 3 (Subject: Microeconomics) "*Even if told not to use AI, students with higher proficiency might still use it, making grading difficult*."
- Teacher 6 (Subject: International Relations) "*Students need to understand the limits of AI use and not rely on it from the beginning*."

Ethical and equity concerns (Sub-code, 6 occurrences)

- Teacher 1 (Subject: Global Politics) "*There are security concerns and ethical considerations regarding the extent of AI use and its impact on students' learning and grading*."
- Teacher 4 (Subject: Physics and Mathematics) "*Differences in students' AI skills may be reflected in their grades, creating inequities*."
- Teacher 6 (Subject: Hospitality Management) "*Clear criteria for AI use need to be established to ensure ethical and fair use in education*."

The SWOT analysis of teachers' data offered a detailed perspective on the integration of AI in EMI courses. Teachers highlighted several strengths, such as AI's ability to improve resource efficiency, aid in assignment creation, and support individual student needs, particularly in language translation and assignment checks.

Opportunities discussed included the ability of AI to free up time for teachers to focus more on content delivery and enhance learning materials, making classes more content-rich and tailored to student needs.

However, they also identified significant weaknesses, particularly in grading and maintaining personal touch. Teachers expressed concerns about the difficulty in distinguishing between students' own work and AI-generated content, and the challenges in assessing students fairly without reflecting AI use. In addition, AI interactions might lead students to confuse AI-generated responses with those from human teachers, potentially altering their expectations of human interaction.

Threats included over-reliance on AI by students, which could diminish the value of teacher guidance and potentially lead to inequities in student performance based on their ability to use AI tools. Teachers also stressed the need for ethical guidelines to manage the integration of AI to ensure it supports fair and effective learning outcomes.

## 4. Discussion

This section discusses the findings in relation to the research questions posed at the outset of the study, focusing specifically on how students and teachers perceive and integrate AI within EMI settings.

### 4.1. Students' perception of the impact of AI on educational outcomes in EMI courses

This study presents diverse perceptions among students and teachers regarding the impact of AI on educational outcomes in EMI courses. AI was primarily employed for routine tasks, such as grammar checking and translation, aligning with the Substitution and Augmentation levels of the SAMR model. The Modification and Redefinition levels were less common and mainly connected to individual students' unique and creative usage of AI.

Concerns about the accuracy and reliability of AI tools, as well as fears of over-reliance and the risk of being perceived as cheating, appeared to limit the extent of AI use in academic settings. These concerns suggest a

cautious approach to integrating AI in EMI courses, with students wary of how their reliance on AI might affect their learning outcomes and how teachers might perceive their work. Furthermore, some students expressed uncertainty about the definition and scope of AI, highlighting a gap in understanding that could influence how effectively these tools are used in education.

### 4.2. Teachers' identified challenges and strategies in integrating AI into EMI settings

The findings from the SWOT analysis indicate that while teachers acknowledge the benefits of AI in streamlining administrative tasks and supporting diverse student needs, there are significant concerns about its impact on traditional teaching roles and direct student engagement in EMI settings. These concerns underline the importance of integrating AI as a complementary tool that enhances rather than replaces traditional instructional methods. By supporting routine tasks, AI can free up teachers to focus more on interactive and critical teaching activities, thus enhancing the overall educational experience without diminishing the teacher's fundamental role in student learning.

One key challenge raised by teachers is the difficulty in grading AI-assisted student work. Teachers expressed concerns about distinguishing between students' independent work and content generated with AI, which complicates the process of assessing students fairly. Additionally, teachers worry that AI interactions could blur the line between human and AI feedback, potentially altering students' expectations of their teachers and the learning process.

Concerns about over-reliance on AI, as also voiced by students, emerged as a threat, with teachers cautioning that students might become dependent on AI for basic tasks, diminishing their development of critical academic skills. The ethical implications of AI use were also a focus, as teachers emphasized the need for clear guidelines to ensure equity in grading, particularly when students' varying levels of AI proficiency may affect their academic performance.

## 5. Conclusion

This study addressed the critical inquiries regarding how AI impacts educational outcomes from the perspectives of students and teachers in EMI settings. It was found that while students perceive AI as a useful tool for routine academic tasks, such as grammar correction and instant feedback, its potential for more transformative applications has not been fully realized. Teachers also identified several challenges in integrating AI effectively and ethically, particularly concerning maintaining academic integrity and the personal aspects of teaching. The findings underscore the necessity of a structured framework and clear guidelines to facilitate the ethical and effective integration of AI tools in EMI courses.

Moving forward, future research should explore how AI in EMI settings can extend beyond basic functionalities to more profoundly influence educational methodologies and outcomes. Investigating how AI can support not only content delivery but also contribute to incidental English language proficiency will be necessary. Additionally, it may be important for teachers to consider more formative assessments over summative assessments, as formative methods better capture the ongoing learning processes influenced by AI tools. One potential avenue is to examine the "peer-effect" in collaborative AI applications, which could significantly enhance both individual learning outcomes and group dynamics in EMI contexts. By expanding its scope, AI has the potential to significantly enhance both the efficiency and quality of education in EMI settings.

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# Identifying and responding to Artificial Intelligence in evaluating written assignments

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***Abstract***

*The paper aims to find out if Slovak students participating in the project 'ePortfolio as Pedagogy Facilitating Integrative Learning' use generative AI in their written assignments and to what extent. Using free AI detectors such as ZeroGPT, QuillBot and Scribbr the assignments will be tested if they are AI/GPT generated, human written including parts generated by AI/GPT or human written. Research will try to come up with answers to the following research questions – RQ1: 'Do the students use AI tools in a way that is dishonest or unfair in order to get what they need?', RQ2: 'Does AI provide the students who are allowed to use it with real help?' and RQ3: 'Are there still students who do not use AI tools?' The paper also discusses briefly favourite AI tools for teachers and best AI detectors used all over the world. Research findings have shown that most Slovak students use AI tools to improve their skill of writing, regardless of using them ethically or not. However, there are still students who do not use them at all. Accordingly, several recommendations will be provided to researchers, academics and teachers for addressing this issue and applying or studying AI applications in language education in the future.*

***Keywords:*** *assignment; writing; AI detector; Artificial Intelligence in language education.*

## 1. Introduction

Artificial intelligence (AI) affects significantly all sectors of people's lives. It has attracted great interest in higher education which is primarily influenced by the development of information and communication technology. According to Crompton and Burke (2023), AI is a tool used across subject disciplines such as language education, engineering education, mathematics education, medical education, and so on. As the field of Artificial Intelligence in Education (AIEd) is growing and changing fast, there is a need to increase the understanding of the power of AIEd in educational contexts (Zawacki-Richter et al., 2019). In their study, Liang et al. (2024) explore the roles and research foci of Artificial Intelligence in Language Education (AILEd). They discuss the studies published from 1990 to 2020 in the Web of Science database and their review results show that the main application domains of AILEd research were writing, reading and vocabulary acquisition.

Ever since OpenAI released ChatGPT to the public for free, students have been testing the limits of chatbots – generative AI tools powered by language-based algorithms – which can complete essay assignments within minutes. This tool is capable of writing good essays. The results tend to be grammatically perfect but

 

intellectually uninteresting, frequent with cliché and misinformation and, therefore, students need to rework what AI generates to get these essays right (Bobrow, 2023). In the United States, many selective colleges give more weight to admissions essays. As more colleges offer test-optional or test-free admissions, essays are becoming more important.

Apart from essays, ChatGPT can also generate articles, jokes, poetry, job applications, and the like in response to text prompts. In the United Kingdom, more than half of undergraduates say they consult AI programmes to help with their essays. A survey of 1,250 UK undergraduates conducted by the Higher Education Policy Institute (Hepi) found that 53% were using AI to generate material for work they would be marked on. One in four are using applications such as Google Bard or ChatGPT to suggest topics and one in eight are using them to create content. Just 5% admitted to copying and pasting unedited AI-generated text into their assessments. Moreover, nearly three-quarters (73%) expect to use AI after they finish their studies (Adams, 2024; Freeman, 2024).

According to Guadamuz (2024), it is not surprising that more and more students are adopting AI and he suggests institutions need to be explicit in discussing how best to use it as a study tool. OpenAI states that all humans will benefit directly from artificial general intelligence. Few American or British colleges have offered guidance for how students can use AI ethically. When students are not given guidance, there is a higher risk of them resorting to plagiarism and misusing the AI tool. US educators are in the process of working out how to respond to AI writing tools like ChatGPT. Research into current guidelines of 100 top universities has revealed that most of them do NOT have definitive guidelines yet. According to Caulfield (2023), at 27% of universities, there seem to be no clear guidance or policy so far, at 51% of universities, individual instructors decide their own policy for now, at 18% of universities, tools are banned by default unless instructors say otherwise, and at 4% of universities, tools are allowed (with citation) unless instructors prohibit them.

The main aim of the paper is to find out if Slovak students, participating in the KEGA Project 'ePortfolio as Pedagogy Facilitating Integrative Learning', a mutual cooperation between the University of Economics in Bratislava (Rusiňáková, 2023) and Trnava University in Trnava, Slovakia, use generative AI in their assignments and to what extent. The assignments will be tested via free AI detectors such as ZeroGPT, QuillBot and Scribbr. Research will try to come up with answers to research questions – RQ1: 'Do the students use AI tools in a way that is dishonest or unfair in order to get what they need?', RQ2: 'Does AI provide the users who are allowed to use it with real help?' and RQ3: 'Are there still students who do not use AI tools?' Accordingly, several recommendations will be provided to researchers, academics and teachers for addressing this issue and applying or studying AI applications in language education in the future.

## 2. Favourite AI tools and best AI detectors

Working group 'AI in education' at Tilburg University in The Netherlands provides a list of favourite AI tools: (a) Chatbots: ChatGPT, GPT Store, Microsoft Copilot (Bing Chat) and Google Gemini, (b) AI tools for teachers: PowerPoint Speaker Coach, ClassPoint AI and GradeScope, (c) Content creation, writing and editing: QuillBot, Canva and Grammarly, (d) Research and information retrieval: Perplexity AI, Explain Paper, Consensus, Elicit, SCI Space and Tavily AI, (e) AI Tools for coding and data analysis: Julius AI, Github Copilot, Monkeylearn and Heuristica. Of course, the list is much longer. In Slovakia and Germany, Adamcová and Rusch (2023) deal with integrating Artificial Intelligence into language curricula, they investigate the complex role of AI, briefly describe chatbots and AI writing assistants such as ChatGPT, Grammarly, and so on.

Since our paper is focused on testing texts via three AI tools, namely ZeroGPT, QuillBot and Scribbr, we searched for the papers in order to find out if and how they are used. It was no problem to find the newest sources describing them. For instance, Latifah et al. (2024) investigate the use of QuillBot in academic writing and offer a systematic literature review. Mohammad et al. (2023) discuss EFL paraphrasing skills via QuillBot and unveil students' enthusiasm and insights. Fitria (2021) describes QuillBot as an online tool and students' alternative in paraphrasing and rewriting of English writing. Yoandita and Hasnah (2024) discuss QuillBot as an alternative writing tool as well as examine its uses on the academic writing performance of EFL learners.

 

In order to find out what the best AI detectors for teachers and students are, we provide the classifications by Lee (2023) and Driessen (2024). Lee (2023) describes the finest AI detecors available for teachers in 2023. She has meticulously handpicked the top 9 options that are highly recommended by educators themselves: (a) Winston AI (with their educators' rating: *****), (b) CopyLeaks (***), (c) Content at Scale (***), (d) AI Detector Pro (****), (e) Scribbr (**), (f) Sapling (**), (g) GPTKit (***), (h) GPTZero (**) and (i) Turnitin (****).

AI detectors are tools designed to detect when a text was generated by an AI writing tool like ChatGPT. AI content may look convincingly human in some cases, but these tools aim to provide a way of checking for it. Driessen (2024) investigated just how accurate they really are. To do so, he used a corpus of testing texts including fully ChatGPT-generated texts, mixed AI-and-human texts, fully human texts and texts modified by paraphrasing tools. He ran all these texts through 12 different AI detectors to see how accurately each tool labelled them. For the purpose of our research, we focus on the first seven ones (Table 1).

**Table 1**. Best AI detectors in 2024. (Source: Driessen, 2024).

| Tool | Accuracy | False positives | Free | Star rating |
|---|---|---|---|---|
| 1. Scribbr (premium) | 84% | 0 | x | 4.2 |
| **2. QuillBot** | **78%** | **0** | **yes** | **3.9** |
| **3. Scribbr (free)** | **78%** | **0** | **yes** | **3.9** |
| 4. Originality.AI | 76% | 1 | x | 3.7 |
| 5. Sapling | 68% | 0 | yes | 3.4 |
| 6. CopyLeaks | 66% | 0 | yes | 3.3 |
| **7. ZeroGPT** | **64%** | **1** | **yes** | **3.1** |

In our research, we will use free AI detectors since some of our students have used them to identify AI when they had to peer-review their classmates' seminar papers.

## 3. Method

### 3.1. Context and participants

The main aim of the research is to find out if third-year students participating in the KEGA Project 'ePortfolio as Pedagogy Facilitating Integrative Leraning' use AI tools to develop their writing skills. In the summer term of 2023/2024, 31 students of the Department of English Language and Literature, Faculty of Education, Trnava University in Trnava, participated in it.

Apart from studying the compulsory topics in the course, they were asked to do four assignments (including CVs/résumés). Firstly, they discussed the importance of the job-seeking process and its main stages: exploring, researching, applying, interviewing, following up and negotiating (Quintanilla & Wahl, 2020). In the third stage, they studied different types of text and their structure, cohesion and coherence (Adamcová, 2014) and then they learned how to write a generic résumé as a starting point for the customized résumé. Also, they distinguished between different types of résumés – chronological, functional, a combination of chronological and functional, for electronic screening and cover letters written in British and American English (Floyd & Cardon, 2020; Tomaska & Nosek, 2018; Wallwork, 2019). Secondly, in a study abroad grant application, they were supposed to describe their academic achievements and professional goals and how this relates to their decision to study

 

abroad, challenges they faced in their decision to study abroad, the funds they came from to pay their living and educational expenses; scholarships and financial aid; and any other information about themseves that they would like the selection committee to consider them to be convenient candidates for the grant. Finally, an energy report (the outcome of a case study) was the most difficult task. When writing a report, they had to follow the sturcuture: executive summary, introduction, findings, conclusion, recommendations and appendices (if they wished to add them).

### 3.2. Data collection instruments

Each student was supposed to do 3 written assignments (covering letter, study abroad grant application and report) during the summer term and submit them to Moodle which is commonly used to support every course by the Department of English Language and Literature. The students received feedback regularly from the lecturer and by doing minor corrections in them or re-writing them, they were able to create their own e-portfolios in Mahara or Google Sites platforms. Altoghether, we were able to gather 89 assignments via Moodle.

### 3.3. Data analysis

First, 89 written assignments, will be tested via AI detectors such as *ZeroGPT*, *QuillBot* and *Scribbr* and then individual students' results will be summarised and compared. Our research will try to answer the following research questions: RQ1: 'Do the students use AI tools in a way that is dishonest or unfair in order to get what they need?' RQ2: 'Does AI provide the students who are allowed to use it with real help?' and RQ3: 'Are there still students who do not use AI tools?'

## 4. Results

### 4.1. Quantitative data results

We found ZeroGPT straightforward to use. We just pasted in text to test it immediately and the results showed a text label, a percentage and text highlighting indicating which parts of the text are most likely AI generated. As it can be seen, Tables 2–4 show the labels in ZeroGPT, percentages per students and percentages per groups.

**Table 2.** Covering letters in ZeroGPT. (Source: Author's data).

| Labels in ZeroGPT | Percentage (Student) | Total |
|---|---|---|
| 1. The text is AI/GPT generated | **100% (S8)**, **100% (S29)**, 98.48% (S25), 98.05% (S26), 94.38% (S18), 87.44% (S24), 87.36% (S5), 80.53% (S12) | 26.7% |
| 2. The text is likely human-written, may include parts generated by AI/GPT | 60.3% (S14), 54.97% (S11), 45.83% (S3), 43.52% (S9), 41.5% (S20) | 16.7% |
| 3. The text is most likely human written, may include parts generated by AI/GPT | 37.43% (S22), 35.96% (S1), 34.99% (S19), 33.54% (S4), 25.57% (S16), 24.69% (S27), 22.15% (S17) | 23.3% |
| 4. The text is human written | 18.28% (S23), 16.8% (S28), 15.34% (S7), 17.05% (S10), 12.82% (S30), 2.76% (S6), **0% (S2)**, **0% (S13)**, **0% (S21), 0% (S31)** | 33.3% |

When looking at the first and second labels (Table 2), more than 40% of the students rely on AI/GPT. However, about one third of the students were able to write their covering letters without the help of AI/GPT.

 

**Table 3.** Study abroad grant applications in ZeroGPT. (Source: Author's data).

| Labels in ZeroGPT | Percentage (Student) | Total |
|---|---|---|
| 1. The text is AI/GPT generated | **100% (S9)**, **100% (S18)**, **100% (S28)**, **100% (S29)**, 97.7% (S26), 97.36% (S25), 92.69% (S24), 67.87% (S12) | 25.80% |
| 2. The text contains mixed signals, with some parts generated by AI/GPT | 68.79% (S11) | 3.23% |
| 3. Most of the text is AI/GPT generated | 66.86% (S8) | 3.23% |
| 4. The text is likely human-written, may include parts generated by AI/GPT | 60.07% (S5) | 3.23% |
| 5. The text is most likely human written, may include parts generated by AI/GPT | 25.96% (S3) | 3.23% |
| 6. The text is human written | 19.9% (S15), 15.51% (S31), 13.65% (S1), 11.81% (S20), 8.85% (S22), 6.79% (S2), 3.6% (S10), **0% (S4)**, **0% (6)**, **0% (S7)**, **0% (S13)**, **0% (S14)**, **0% (16)**, **0% (17)**, **0% (S19)**, **0% (S21)**, **0% (S23)**, **0% (27)**, **0% (S30)** | 61.29% |

Considering study abroad grant applications (Table 3), again approximately 40% of the students used AI tools to create them. However, more than 60% of the students did not rely on any AI tools.

**Table 4.** Reports in ZeroGPT. (Source: Author's data).

| Labels in ZeroGPT | Percentage (Student) | Total |
|---|---|---|
| 1. The text is AI/GPT generated | **100% (S25)**, 97.11% (26), 95.81% (S12), 94.08% (S17), 88.73% (S18), 88.55% (S28), 86.67% (S7), 78.41% (S8), 77.35 (S29) | 32.14% |
| 2. Most of the text is AI/GPT generated | 63.26% (S24) | 3.57% |
| 3. A text is most likely AI/GPT generated | 62.58% (S31), 53.09% (S27) | 7.14% |
| 4. The text is likely generated by AI/GPT | 42.18% (S22) | 3.57% |
| 5. The text is most likely human written | 18.66% (S4) | 3.57% |
| 6. The text is human written | 19.64% (S9), 17.2% (S30), 11.47% (S2), 7.59% (S5), 1.77% (S15), **0% (S3)**, **0% (S10)**, **0% (S11)**, **0% (S14)**, **0% (S16)**, **0% (S19)**, **0% (S20)**, **0% (S21)**, **0% (S23)** | 50% |

 

As far as energy reports are concerned (Table 4), nearly 50% of the students used AI/GPT. However, there are still students who do not use AI tools at all. To conclude, more and more students turn to AI/GPT for help.

In Tables 5–6, individual students' results are worth considering. In Table 5, 12 out of 31 students who definitely rely on AI are highlighted in olive-green colour. The assignments (Ass1, Ass2, Ass3) were written with the help of AI tools since it was confirmed by at least two (in some cases three) AI detectors as '100% AI-generated.'

**Table 5**. Students using AI tools to improve their writing skills. (Source: Author's data).

| | Ass1 – Covering letter | | | Ass2 – Study abroad grant application | | | Ass3 – Report | | |
|---|---|---|---|---|---|---|---|---|---|
| Student | ZeroGPT | QuillBot | Scribbr | ZeroGPT | QuillBot | Scribbr | ZeroGPT | QuillBot | Scribbr |
| S3 | 45.83% | **100%** | **100%** | 25.96% | 91% | 100% | 0% | 68% | 53% |
| S7 | 15.34% | 0% | 7% | 0% | 0% | 24% | 86.67% | **100%** | **100%** |
| S8 | **100%** | 67% | **100%** | 66.86% | 87% | 87% | 78.41% | **100%** | **100%** |
| S9 | 43.52% | 36% | 24% | **100%** | **100%** | **100%** | 19.64% | 0% | 79% |
| S11 | 54.79% | 0% | 13% | 68.79% | **100%** | **100%** | 0% | 0% | 62% |
| S12 | 80.53% | 77% | 100% | 67.87% | **100%** | **100%** | 95.81% | 91% | 100% |
| S18 | 94.38% | 87% | 100% | **100%** | **100%** | 71% | 88.73% | **100%** | **100%** |
| S24 | 87.44% | **100%** | **100%** | 92.69% | **100%** | **100%** | 63.26% | 83% | 100% |
| S25 | 98.48% | **100%** | **100%** | 24.87% | **100%** | **100%** | **100%** | **100%** | **100%** |
| S26 | 98.05% | **100%** | **100%** | 97.7% | 86% | 100% | 97.11% | **100%** | **100%** |
| S28 | 16.8% | 0% | 26% | 22.25% | **100%** | **100%** | 14.25% | **100%** | **100%** |
| S29 | **100%** | **100%** | 65% | **100%** | 74% | **100%** | 77.35% | 83% | 100% |

**Table 6**. Students who do not use AI tools to improve their writing skills. (Source: Author's data).

| | Ass1 – Covering letter | | | Ass2 – Study abroad grant application | | | Ass3 – Report | | |
|---|---|---|---|---|---|---|---|---|---|
| Student | ZeroGPT | QuillBot | Scribbr | ZeroGPT | QuillBot | Scribbr | ZeroGPT | QuillBot | Scribbr |
| S4 | 33.54% | 68% | 100% | **0%** | **0%** | **0%** | 16.66% | 0% | 34% |
| S6 | 2.76% | 0% | 25% | **0%** | **0%** | **0%** | --- | --- | --- |
| S10 | 17.05% | 0% | 26% | 3.6% | 0% | 40% | **0%** | **0%** | **0%** |
| S16 | 25.57% | 0% | 19% | 0% | 9% | 2% | **0%** | **0%** | 1% |

 

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| S21 | **0%** | 14% | **0%** | **0%** | **0%** | **0%** | **0%** | **0%** | 1% |

In Table 6, students who do not use any AI tools to improve their writing skills are highlighted in orange colour. It was also confirmed by two or three AI detectors (0%).

### 4.2. Testing the text via AI detectors

The following Figures 1–3 show Assignment 2 written by Student 9. All three AI detectors – ZeroGPT, QuillBot and Scribbr labelled it as '100% generated by AI.'

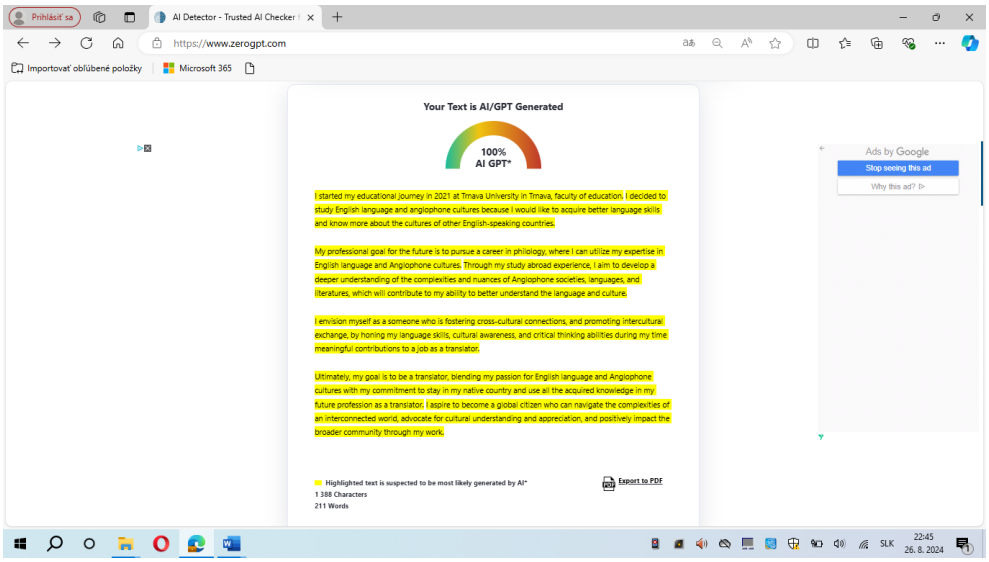


Figure 1. Testing the text in ZeroGPT. (Source: S9, Author's data).

Apart from the label '100% of the text is likely AI-generated', QuillBot also lists 'AI-generated and refined', 'human-written and AI-refined' and 'human-written'. To enhance one's writing, it offers to try a Paraphraser.

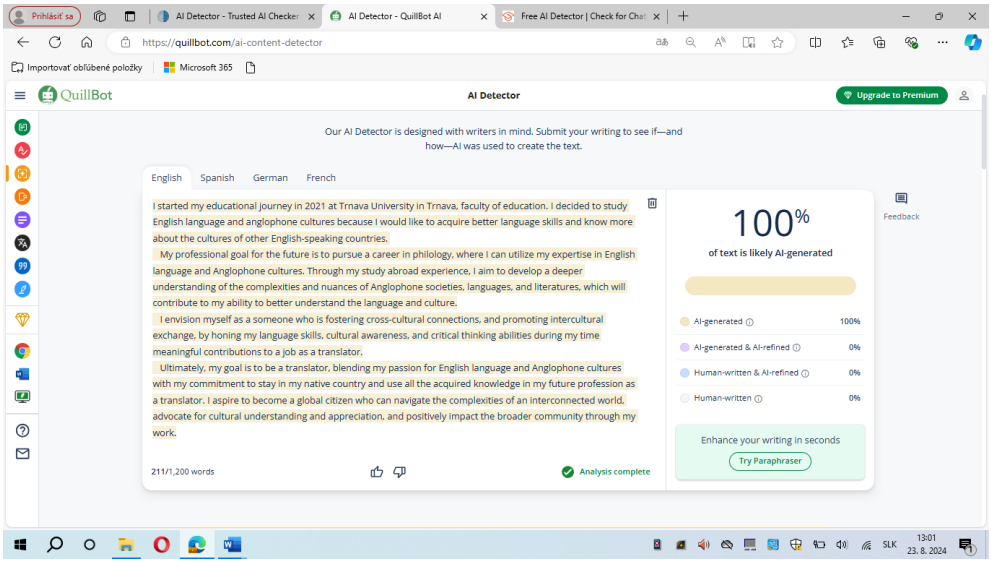


Figure 2. Testing the text in QuillBot. (Source: S9, Author's data).

Both ZeroGPT (Figure 1) and QuillBot (Figure 2) highlight suspected parts of the text in yellow and pink colour.

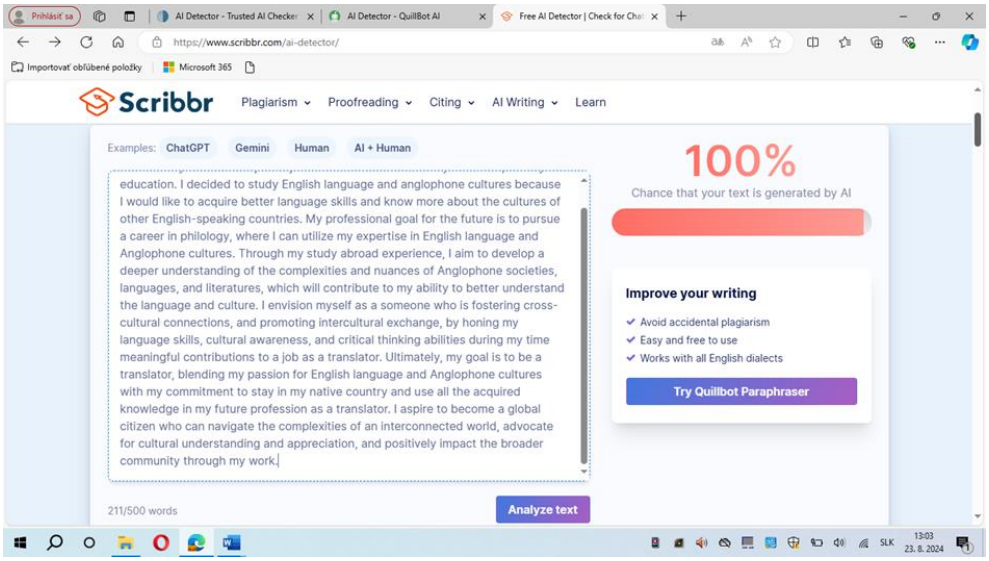


Figure 3. Testing the text in Scribbr. (Source: S9, Author's data).

Regarding Scribbr, Assignment 2 was labelled as '100% chance that your text is generated by AI.' Additionally, Scribbr suggests improving one's writing in order to avoid accidental plagiarism and that a Paraphraser is easy and free to use as well as it works with all English dialects.

In addition, we need to mention, at least, Student 20 who does not use AI tools at all and his/her Ass2 (11.81%, 0%, 0%). After reading this assignment we realised how many stylistic, grammatical and spelling mistakes or errors he/she had made. We decided to improve this text by QuillBot Paraphraser (Figure 4).

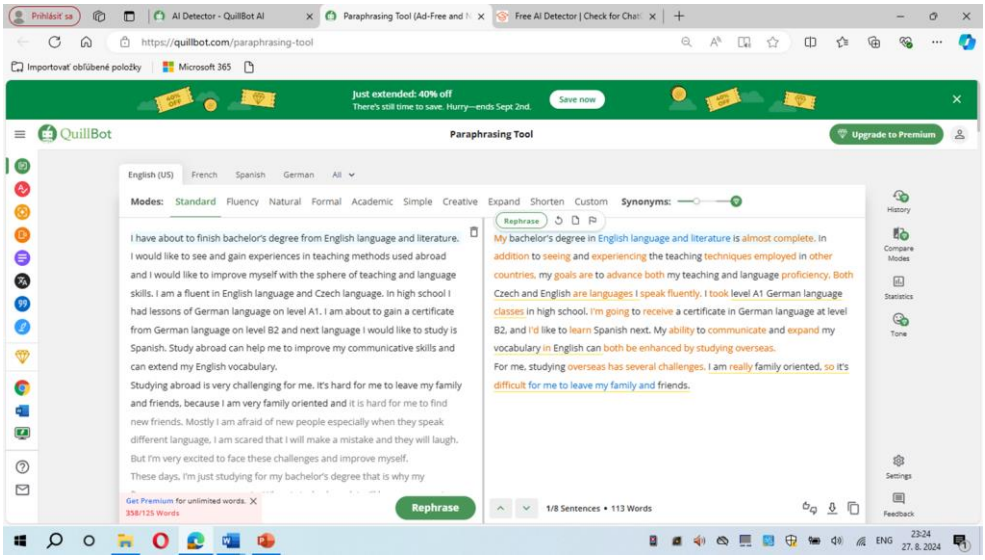


Figure 4. Paraphrasing the text in QuillBot. (Source: S20, Author's data).

The only thing this student needs to do is to paste the text into a QuillBot Paraphraser tool. The text is rephrased in seconds and the student can immediately see what kind of mistakes and errors he/she has made and does not have wait for the lecurer's feedback. In the future, the student will definitely be encouraged to use it.

## 5. Discussion

Our research has shown that more students use AI tools when doing written assignments. We strongly agree with Guadamuz (2024) who states that it is not surprising more and more students adopt AI tools. One of the main

advantages is that it is extremely quick to do a piece of writing with the assistance of AI. AI tools such as ChatGPT are here to help them. However, they need to realise that AI tools are allowed to use for generating ideas not for copying all texts without paraphrasing them at all.

Our research answers the following research questions:

RQ1: 'Do the students use AI tools in a way that is dishonest or unfair in order to get what they need?' The answer is: 'Yes, they do.' For example, Student 3 (Ass1 – 45.83%, 100%, 100%), Student 8 (Ass1 – 100%, 67%, 100%; Ass3 – 78.41%, 100%, 100%), Student 9 (Ass2 – 100%, 100%, 100%), Student 11 (Ass2 – 68.79%, 100%, 100%), Student 12 (Ass2 – 67.87%, 100%, 100%), Student 18 (Ass2 – 100%, 100%, 71%; Ass3 – 88.73%, 100%, 100%), Student 24 (Ass1 – 87.44%, 100%, 100%; Ass2 – 92.69%, 100%, 100%), Student 26 (Ass1 – 98.05%, 100%, 100%; Ass3 – 97.11%, 100%, 100%), etc. They needed to do these assignments and they managed to submit them to Moodle (Table 5).

If we consider the projects like ours, we do not think the statistical comparison of the results at the beginning and the end of the term will differ much. Therefore, if we want to measure students' real improvement we should ban using AI tools. Especially, Students 18, 24, 25, 26 and 29 overused AI tools. We also noticed that Students 11, 20 and 24 got worse marks from a final written examination and Students 9 and 26 had to retake it once or twice.

RQ2: 'Does AI provide the users who are allowed to use it with real help?' The answer is: 'Yes, it does.' For instance, all these students (Table 5) submitted to Moodle the assignments of higher quality than expected. It definitely helped Student 25, with special educational needs, to carry out his/her duties.

RQ3: 'Are there still students who do not use AI tools?' The answer is: 'Yes, there are.' For instance, Student 6 and Student 21 do not rely on AI tools at all. From our experience, we can state that they were either excellent at speaking or very good at taking final written examinations. We noticed that Students 4, 10 and 16 got As from written examinations and Students 6 and 21 got Bs from them.

*Research limitations.* Firstly, even though the students had enough time to do their assignments in classroom and were controlled, helped and encouraged all the time by a lecturer, some of them were not able to complete them in a sminar. Secondly, two or three students submitted their assignments in PDF formats. When we copied the text from this format, the percentage was low. However, when we copied the text from a PDF format and put it in a Word document, the percentage was much higher. In our view, the difference likely arises from how text is processed and formatted when it is copied from a PDF to a Word document. PDFs may introduce irregularities that disrupt the detector's algorithms, while Word tends to standardise and clean the text, making it easier for the AI detection tool to assess the content as AI-generated.

Thirdly, some of the students were not able to submit their assignments for grading on time, in extreme cases they were more than 50 days late, but we think they decided to take examinations at the last resort. Finally, Considering AI tools, Scribbr was the one that tested up to 500-word texts and in some cases energy reports were longer than that.

As far as *further research* is concerned, we aim to analyse students' pre-tests and post-tests written at the beginning and the end of the summer term of 2023/2024 via statistical methods to find out the significance of the difference between the level of knowledge acquired during the term. In addition, we aim to do a literature review on the best AI tools for students and teachers in order to create our own guidelines for using AI tools in educational context.

## 6. Conclusions

Modernising the education process, developing digital literacy and improving writing skills are partial objectives of the Project KEGA 'ePortfolio as Pedagogy Facilitating Integrative Learning'. In higher education, in courses in English for Specific Purposes and English for Academic Purposes students should acquire and improve all four skills. Reading and writing and listening and speaking need to be integrated in order to achieve the set objectives. Morevoer, integrative learning improves performance which then leads to professional excellence.

 

There is no doubt that in the past the skill of writing was the most difficult one to acquire. When this project was written and submitted for getting a grant from the Cultural and Educational Grant Agency in Slovakia, no ChatGPT was in place. Therefore, it was aimed at practicing writing genres such as a formal and semi-formal e-mail, a minutes of a meeting, a summary, a CV, a covering letter, a study abroad grant application, a report, etc.

However, these days we face a new challenge. Since ChatGPT was officially reseased in November 2022 to the public for free, students all over the world turn to it to help them with essays, job applications, summaries, and the like. Since we need to evaluate the project statistically if our students' skills have improved after hard work done during the terms, we tried to find out if they also use AI tools. Therefore, our research tested their written assignments via AI detectors such as ZeroGPT, QuillBot and Scribbr. The final results are really surprising – most of the students use them, but there are also students who do not rely on them at all. Therefore, it is lecturers' duty to find out what AI tools are the best ones for students and work out the guidelines for them to use several AI tools ethically. In addition, we hope this paper will contribute to working out the guidelines for the lecturers and for our university.

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# Pre-service teachers' perceptions of AI and its impact on literature in English language teaching

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***Abstract***

*Technological innovations in artificial intelligence (AI) have led to the emergence of generative artificial intelligence, which is capable of creating a wide range of synthetic written material. The integration of generative AI enables English language teachers to transform traditional teaching into an active process, thereby increasing the engagement of students. However, integrating AI into the educational system raises concerns about emerging ethical dilemmas and risks. Generative AI is able to produce texts, edit existing pieces of literature, and generate reading comprehension tasks related to these texts. This paper deals with the attitudes of future teachers of English, the Master's degree at Trnava University, towards AI and its implementation in English language teaching. The research focuses mainly on integrating AI using literary texts in EFL (English as a Foreign Language) classrooms. The study involved non-native English language and literature pre-service teachers, preparing to teach* EFL *at the lower and upper secondary levels of education. The research analyses qualitative and quantitative data and employs a non-experimental design. The research findings indicate that while teacher trainees in Slovakia exhibit a range of attitudes towards the use of literary texts and AI-based tools in EFL classrooms, with a significant portion remaining neutral or unfamiliar with these technologies, there is a moderate recognition of their potential role in enhancing English language teaching.*

***Keywords:*** *English language teaching; artificial intelligence; information technologies; literature perception; pre-service teachers.*

## 1. Introduction

The function of literature in the context of English language teaching has undergone a significant transformation, evolving from a mere instrument for grammatical instruction to a resource for fostering language proficiency and engaging learners. The role of literature in English language teaching was significant in the late 19th century when the grammar-translation method was popular among language teachers. Although literature was employed in the field of English language teaching, the primary aim was to facilitate mastery of grammatical structures and vocabulary. Interest in the aesthetic function of literary texts was a minor factor. Nowadays, teachers are again exploring the potential of incorporating literature into the learning process. However, the primary aim differs from that of the grammar-translation method. Literary texts serve as a resource for activities that challenge learners to develop their language proficiency and intercultural awareness in an aesthetically pleasing manner. This shift highlights the increasing acknowledgement of the multifaceted role of literature in enhancing the language learning experience.

 

The advantages of using literature in English language teaching (ELT) are based on the various functions of literature and its authentic nature. The authentic character of literature provides learners with exposure to language in its natural use, which is beneficial for the development of intercultural communication. These aspects were previously identified by Collie and Slater in 1987. As evidenced by their research, literary texts facilitate personal involvement and contribute to the enrichment of learners' cultural and linguistic knowledge (Collie & Slater, 1987, pp. 3-6). This concept is also supported by Littlewood (2011), who provides a detailed elaboration on the role of literature within the learner-centred approach. "As authentic materials, literary texts are linked to the real-world context of the learners and, as such, promote a more learner-centred approach" (Littlewood, 2011, p. 549). Therefore, incorporating literature into ELT not only enhances linguistic and cultural understanding but also fosters a more engaging and learner-centred educational experience.

Literary texts offer students linguistic, cultural, aesthetic, intellectual, socio-moral and personal enrichment. The expansion of students' linguistic and cultural knowledge has been the subject of analysis in several studies. In his 1972 study, Adler put forth the proposition that learners are "exposed to language that is as genuine and undistorted as can be managed in the classroom context (p. 47)." In light of the aforementioned considerations, literary texts provide learners with authentic samples of language and culture. Moreover, it is important to consider the potential for personal enrichment, as literature can serve as a starting point for the discussion or writing. Learners may respond linguistically and emotionally, thereby developing the capacity to engage with literary texts in a critical manner. The impact of literature on personal growth was emphasised by Adler. In alignment with Adler's (1972) perspective on personal enrichment, Nguyen builds upon this concept and provides further elaboration.

> Personal involvement can be understood as the readers' close contact with the characters or the engagement in the event of the story. Learners would be motivated in their learning process when they find themselves capable of giving their emotional responses. (Nguyen, 2008, p. 121)

The personal involvement of learners combined with linguistic and cultural development can also positively affect their intellectual and socio-moral development, as literature encourages critical and creative thinking, enriches the learner's knowledge of the world, and makes the students aware of different human situations and conflicts. What is more, these aspects are developed and discussed in an aesthetically pleasing way, as the primary function of literature is the aesthetic function. Thus, the multifaceted benefits of literary texts underscore their role in fostering educational development.

When integrating literature into an English as a foreign language (EFL) classroom, it is essential for the teacher to be aware of the specific position of a literary text as authentic material, in comparison to mother tongue-based education. In an EFL classroom, the literary text serves the needs of the learners' linguistic, cultural, and personal development. Based on the aspects mentioned above, one of the most effective ways for introducing literary texts into an EFL classroom seems to be three models of teaching literature proposed by Carter and Long (1991):

- Cultural model (text is treated as a source of information about the target culture)
- Language model (texts are seen as resources for language practice)
- Personal growth model (text directs the readers to construct meaning from their own experiences)

Nowadays, the position of literature in the context of language education is shaped by many factors, including the selected literary text and model of teaching literature, as well as the advent of information technologies (IT) and artificial intelligence (AI). IT and AI have rapidly developed in recent years. This development affects ELT in both direct and indirect ways. On the one hand, it enables the teacher to prepare meaningful tasks incorporating IT and/or AI. On the other hand, AI can assist the teacher in preparing lessons, thereby facilitating the integration of literary texts into the EFL classroom. AI can produce written texts, edit existing literary works, and generate reading comprehension tasks related to these texts. It is, therefore, important to integrate ICT programmes and AI into teacher training.

Considering the impact of AI on the role of literature in English language teaching, it is important to focus on AI tools that can facilitate the integration of literary texts into the EFL classroom. Nowadays, AI tools are developing rapidly, and there is a huge variety of them that can be used in ELT. With regard to the integration of

 

literary texts into the EFL classroom, the most suitable AI tools are Text Inspector Scorecard, ChatGPT, Copilot and Genially (which provides AI-powered gamification, for instance, in the form of escape rooms). Firstly, Text Inspector is a digital tool designed for the detailed analysis and adaptation of textual content. The software is capable of assessing the level of a given text in accordance with the CEFR (the Common European Framework of Reference) criteria. Sedondly, the Copilot software and ChatGPT are capable of creating original texts or editing existing pieces of literature. Copilot and ChatGPT are capable of comparing the original text with the simplified version and analysing the changes. Thirdly, Genially is capable of creating AI gamification. In this context, virtual escape rooms are suitable. The themed escape room templates are equipped with animated graphics and interactive buttons that are already set up. The teacher only has to add questions and answers; for example, reading-comprehension tasks. These AI tools enable educators to create a more engaging EFL learning environment that integrates literary texts and enhances students' reading comprehension and enjoyment of literature.

The Ministry of Education, Science, Research and Sport of the Slovak Republic urges higher education institutions to reflect on emerging challenges together (Vysoké školstvo, 2024). It is very important to concentrate on the ability of teacher trainees to work with information technologies as these can be characterised as inseparable components of the 21st-century learner's life and education. The present study analyses the practical experience of English language teacher trainees in the implementation of artificial intelligence (AI) in the context of using literary texts in English as a Foreign Language (EFL) classrooms.

The main aim of the presented research was to investigate the current state of future teachers' attitudes to technologies while using literary texts in the EFL (English as a foreign language) classroom.

The general objectives of the research can be summarised as follows:

- To identify the information and communication technologies programmes used by future English language teachers.
- To analyse the attitudes of teacher trainees towards the use of computer-assisted learning (CALL) and artificial intelligence in the field of English language teaching.

## 2. Method

The research employs a non-experimental design, which is appropriate for the analysis of data obtained from questionnaires completed by English language teacher trainees. The research sample comprises 45 English language and literature students at the Faculty of Education of Trnava University in Trnava, Slovakia (the study programme English language teaching and the study program English language and literature in combination with another approbation subject). The study involved non-native English language and literature students (master's degree) preparing for the role of teachers of English as a foreign language at the lower and upper secondary levels of education. The respondents were selected on the basis of a compact group approach, ensuring a high level of homogeneity in terms of their educational background and professional experience. The questionnaire was administered to enhance the quality of the course "Literature in Language Education." It should be noted that the questionnaire, in its printed paper form, was completed at the beginning of the 2023/2024 academic year. This was done in order to gain insight into the areas that would require further attention in the coursework.

The questionnaire was composed of both open-ended and closed-ended questions. Some of the closed-ended questions employed a five-point Likert rating scale. The questionnaire enabled the students to reflect on their attitudes towards technology. The research required the implementation of various methods derived from the research objectives and assumptions. Quantitative methods facilitated the selection, categorisation and systematisation of the sample data. Qualitative methods such as qualitative content analysis of open-ended questions and synthesis were employed to gain a deeper understanding of qualitative data. Frequency table, pie chart and bar charts are used for descriptive statistical graphical representation.

 

## 3. Results

With regard to the research objectives, the paper examines students' responses to the importance of using literary texts in EFL classrooms. The responses were measured using a five-point Likert rating scale.

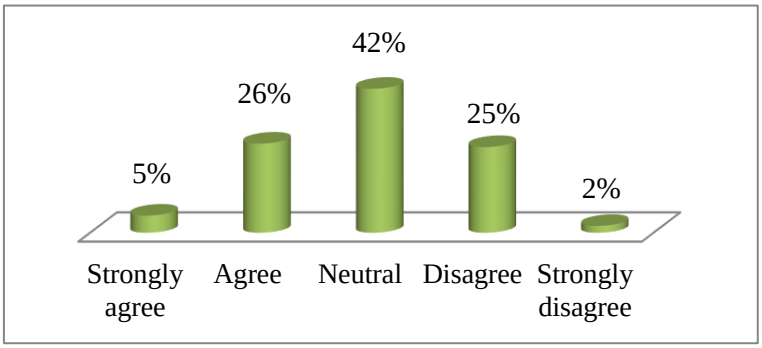


Figure 1. The use of literary texts in the classroom.

This horizontal bar graph (Figure 1) illustrates the distribution of responses across the five categories. The most notable aspect is the high percentage of neutral responses (42%). The proportion of respondents who selected either the "Agree" or "Disagree" option is comparable. There is also a high percentage of respondents who selected "Disagree" or "Strongly disagree" (27%).

An understanding of the functions of computer-assisted learning and AI in the field of English Language Teaching (ELT) can assist educators in integrating literary works into their curricula and in devising reading comprehension tasks that are both meaningful and effective. That is the reason the second graph deals with the responses to the question: "What is the role of computer-assisted learning and artificial intelligence in ELT?"

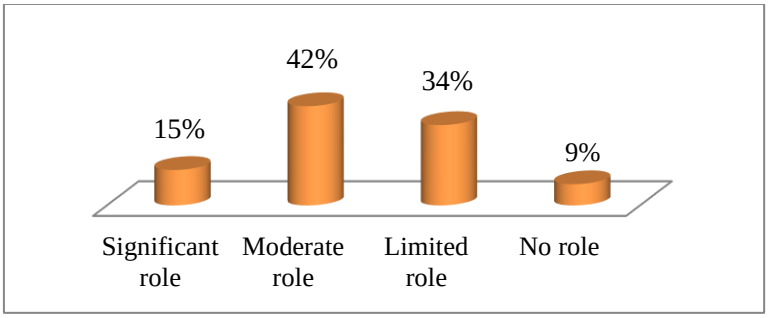


Figure 2. CALL and AI in ELT.

Figure 2 illustrates the perceived role of CALL and AI in English Language Teaching. The largest segment (42%) indicates that a moderate role is the most commonly perceived role. A notable proportion (34%) believes that CALL and AI play a limited role. Only 15% of respondents views technology as having a significant impact, while 9% believes that technology has no role in ELT.

A dichotomous closed-ended question focused on integrating AI into teacher trainees' teaching practice (not university studies). The respondents were asked the following question: "Are you currently using AI in your teaching practice?"

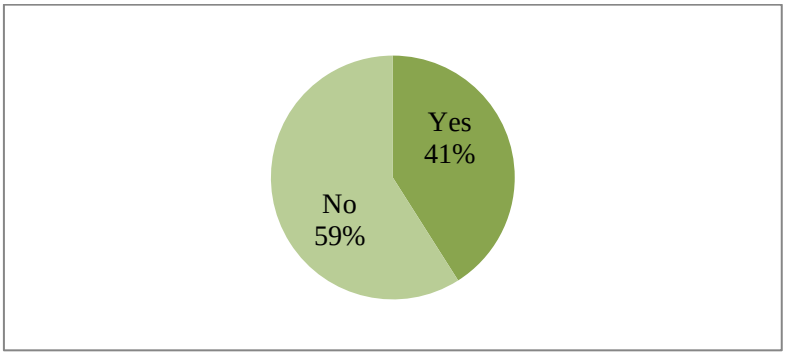


Figure 3. AI in ELT

Figure 3 indicates that although a considerable number of students have incorporated AI into their teaching practice, the majority of them have not yet integrated AI into their teaching.

The last part of the research presented in this paper is concerned with the data collected in response to the open-ended question: "What AI-based tools are you familiar with or currently utilising?"

**Table 1**. A list of AI-based tools students know or use

| AI-based tools | Total number | Percentage |
|---|---|---|
| ChatGPT | 13 | 28% |
| Copilot | 10 | 22% |
| Canva | 10 | 22% |
| Grammarly | 8 | 18% |
| DeepL | 5 | 11% |
| Gemini | 5 | 11% |
| No tools | 4 | 9% |

The data presented in Table 1 indicates that a notable proportion of respondents (28%) are familiar with or use ChatGPT. This is followed closely by Copilot and Canva. Additionally, Grammarly, DeepL, and Gemini are also known or used by a smaller percentage of respondents. Conversely, a small portion of respondents (9%) indicated that they did not use or know any AI-based tools.

## 4. Discussion

Information technologies and artificial intelligence are undergoing rapid development in the contemporary era. This is the rationale behind the efforts to integrate ICT and AI into teacher training. The ongoing objective of university teachers can be defined as a commitment to the improvement of the quality of the courses they teach. That is the reason the questionnaire was completed at the beginning of the semester in order to gain insight into the areas that would require attention in the coursework. The completed questionnaire offered insights into the students' experiences with AI, as well as their attitudes towards the integration of literary texts in English language teaching.

Firstly, in relation to the statement: "It is important to use literary texts in EFL classrooms," it can be observed that the most notable aspect is the high percentage of neutral responses (42%), indicating that a significant portion of respondents did not have a strong opinion on the subject. The proportion of respondents who selected either the "Agree" or "Disagree" option is comparable. The high percentage of respondents who selected "Disagree" or "Strongly disagree" (27%) indicates that the students do not believe in the benefits of using

 

literary texts in an EFL classroom. These research results reflect the prevailing attitudes of teacher trainees in Slovakia. These data diverge slightly from other studies dealing with teacher trainees' attitudes in different countries. The findings of the studies presented by Tuncer and Kizildag (2014) and Karakaya and Kahraman (2013) vdemonstrate that the majority of participants in Turkey agreed upon the benefits and necessity for the use of literature in ELT classes. However, they exhibited hesitations regarding the possibilities of this use. It is, therefore, necessary to enhance students' awareness of the significance of literary texts in the English language curriculum while also assisting them in overcoming challenging aspects, for instance, through the integration of AI into the teaching process.

Secondly, Figure 2 addresses the responses related to the question: "What is the role of computer-assisted learning and artificial intelligence in ELT?" The largest proportion (42%) indicates that a moderate role is the most commonly perceived role. This indicates that teacher trainees perceive technology as an important but not dominant part of ELT. A notable proportion (34%) believe that CALL and AI play a limited role. This may indicate that modern technologies and AI have not been fully integrated or utilised to their potential. Only 15% of respondents view technology as having a significant impact, while 9% believe that technology has no role in ELT. This could be attributed to a lack of resources, training, or belief in the effectiveness of these tools. These data are partially aligned with existing research on teachers' perceptions of technology use in language classrooms. The findings of studies conducted by authors such as Aljohani (2021), Djiwandono (2019) and Muslem et al. (2018) consistently demonstrate that teachers have positive perceptions of the use of technology in language classrooms. Sumakul et al. (2022) conducted an analysis of how teachers perceive the use of AI in their EFL classrooms. They assert that all teachers in their studies have positive perceptions towards the use of AI in their classrooms. However, other researchers, such as Arnold and Ducate (2015), have found that language teachers are still unable to exploit the pedagogical advantages of technology. It is therefore necessary to address these issues, for example, by integrating AI into university courses.

Thirdly, a dichotomous closed-ended question focused on responses to the following question: "Are you currently using AI in your teaching practice?" The question focused on students' teaching practice, as opposed to their university studies, which would include final theses, essays, research papers, etc. It can be assumed that this is why the answers shifted towards a negative option more significantly. This indicates that although a considerable number of students have incorporated AI into their teaching practice, the majority of them have not yet integrated AI into their teaching. The reasons might be similar to those presented in the research conducted by Susanto and Yosephine (2019) and Ding et al. (2019). This research characterises the problematic aspects as the excessive amount of time and energy required, and proposes offering assistance to teachers. This aligns with the intention of this research. The integration of CALL and AI into university courses dealing with ELT could be beneficial for students in terms of learning how to use AI in the classroom..

Finally, the last part of the research presented in this paper is concerned with the data collected in response to the open-ended question: "What AI-based tools are you familiar with or currently utilising?" The data indicates that a notable proportion of respondents (28%) are familiar with or use ChatGPT. ChatGPT is followed closely by Copilot and Canva. Additionally, Grammarly, DeepL, and Gemini are also known or used by a smaller percentage of respondents. Conversely, a small portion of respondents (9%) do not use or know AI-based tools. These findings align with trends observed in educational technology research. For instance, a review of AI tools in education highlights that AI-powered applications like ChatGPT and Copilot are increasingly integrated into teaching and learning environments due to their ability to enhance instructional practices and provide personalised learning experiences (Yim, Su, 2024). Similarly, tools like Grammarly and DeepL are recognised for their ability to improve language proficiency (Almasri, 2024).

## 5. Conclusions

The advantages of utilising literature in the field of (ELT) are founded upon the multifaceted functions of literature and its authenticity. Literary texts provide a valuable resource for activities that challenge learners to develop their language proficiency and intercultural awareness in an aesthetically pleasing manner. The integration of literary texts in ELT is now more straightforward than ever before, largely thanks to the advent of

 

modern technologies, particularly in the field of AI. Artificial intelligence (AI) has the capacity to produce written texts, edit existing literary works, and generate reading comprehension tasks related to these texts.

It is crucial to incorporate ICT programmes and AI into teacher training. That is the reason the main aim of the presented research was to investigate the current state of future teachers' attitudes to technologies while using literary texts in the EFL classroom. The general objectives can be summarised as: to identify the information and communication technologies programmes used by future English language teachers, and to analyse the attitudes of teacher trainees towards the use of computer-assisted learning and artificial intelligence in the field of English language teaching.

The research presents significant findings regarding the attitudes and practices of teacher trainees in Slovakia towards the use of literary texts and AI-based tools in EFL classrooms. Despite the presence of AI in some teaching practices, the majority of trainees have not yet adopted these technologies. There is considerable variation in familiarity with AI-based tools, with ChatGPT being the most recognised, followed by Copilot and Canva. However, a small percentage of trainees are not familiar with any AI tools. Therefore, the research aim and the research objectives can be characterised as achieved.

The limitations of this research are linked to the size of the research sample, which comprised 45 English language and literature students at the Faculty of Education of Trnava University in Trnava. In light of the findings, it is recommended that the results of this research be taken into account when developing new study programmes at faculties of education. With regard to future research, it would be beneficial to consider the attitudes of in-service teachers towards the use of computer-assisted learning and artificial intelligence in the field of English language teaching. Moreover, research could concentrate on the AI tools that in-service teachers employ in the practice. By gaining insight into their perspectives, potential barriers and facilitators to the adoption of these technologies could be identified. By analysing these aspects, universities could reflect on the needs of in-service teachers and adapt their courses according to these needs, as well as offer webinars to support teachers in integrating these technologies into their classrooms.

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# CALL and developing soft skills

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# Effective use of foreign languages as a prerequisite for Erasmus+ mobility – a study among secondary school students

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***Abstract***

*Studying abroad requires a specific set of social competences, psychological predispositions, educational and intercultural skills, including the ability to function in the digital academic environment. A candidate needs to have functional proficiency in a foreign language (multilingual and plurilingual) at least at the B2 level (preferably C1), even to start practicing digital skills as a prerequisite for application. The better prepared they are, the more they can achieve. The earlier they start thinking about studying abroad, the easier it will be for them to take advantage of the opportunity. The study examines secondary school learners' readiness for Erasmus+ mobility in terms of their attitudes, intentions and confidence in their own linguistic and social abilities. An online self-report survey was conducted among 243 learners aged 16-17 in three secondary schools in Warsaw, Poland. Descriptive statistics were used to analyse the data. The results show that most of them are well prepared in terms of language skills, but they lack institutional support to overcome uncertainties related to the use of language in academic and digital environments as well as some aspects of their well-being during their stay abroad. Some recommendations for schools on how to prepare young people for future challenges have been drawn from the findings.*

***Keywords:*** *Erasmus+ mobility; secondary school learners; language skills; well-being; readiness to study abroad.*

## 1. Introduction

Studying abroad under the Erasmus+ mobility programme has become a quite fairly common practice among students in Europe, since it was launched in 1987 [later as part of Socrates (1995-2006), Lifelong Learning programme (2007-2013), Education, Training, and Youth (since 2014)] (*Erasmus+ EU programme for education, training youth, and sport*, 2024). To date, more than 30 million students have participated in the programme. Poland joined the programme in 1998. Since then, more than 266,000 Polish students have studied abroad (*Podsumowanie programu Erasmus na 20 lecie Polski w UE*, 2024). This is a small proportion of the total number of students in the country.

The experience should be enriching for the participant in terms of professional and academic achievement as well as human well-being and, if positive, can open new career prospects for the participant. It involves interacting with people and digital documents in a foreign language in a formal academic environment at every stage of the experience. However, students face several challenges while studying in the host countries. It therefore requires a range of preparations, of which language skills appear to be essential.

 

A review of the research on students' experiences (Keri et al., in press) helps to identify the key factors that influence perceptions of their stay abroad. This can support action to involve prospective students in the preparation process.

The aim of the study was to examine whether secondary school learners (1) were interested in studying abroad and (2) had participated in international virtual exchange. It also checked (3) which languages they spoke; and (4) how they responded to selected challenges that might affect their well-being in terms of mobility.

Participation in the survey was also seen as a learning experience for the respondents; the educational objective of the study was to make learners aware of the opportunities open to them at the next stage of their education. The survey was part of their entrepreneurship course.

## 2. Literature review

The literature review is divided into two parts. In the first part, a corpus of 104 articles collected by the members of the ENIS European Network on International Student Mobility Working Group (WG3) was used to identify the importance of language skills in the socialisation, social and intercultural integration of students in the host countries in formal and informal settings. In the second part, the state research on secondary school learners (SSL) is presented, with suggestions for how to help them benefit from the opportunity to participate in the Erasmus+ mobility at the next stage of their education.

### 2.1. Linguistic needs of sojourners

The importance of foreign language for studying abroad seems to be indisputable and is commonly acknowledged. However, it is worth examining the literature on the subject. The linguistic needs of the students were studied using a corpus of 104 articles, collected by the Working Group 3 (a subgroup focused on Education) of the ENIS COST Action. The texts in the corpus focused on the influence of International Student Mobility (ISM) on the socialisation, social and cultural integration of students in the host country during their stay abroad. Another focus of the study was to identify the barriers and limitations to social and cultural integration (Keri et al. in press). An original corpus study carried out on the same texts to identify the frequency of language-related issues shows that in 19 articles, language skills significantly impact socialisation processes, either supporting them in cases of high proficiency or posing a significant challenges when proficiency is insufficient. In 34 articles, language is mentioned as the main factor promoting social and cultural integration, either between the students and locals or among the students themselves.

In the academic context, the role of language skills is crucial, as 55 articles mention language barriers between lecturers and students. The barriers include communication styles, low level of academic language, lack of social circles due to language, fear of acquiring "incorrect" language habits (c.f. Hessel, 2019), and language problems in non-English speaking countries (c.f. Peet et al., 2015).All in all, language skills affect the areas of socialisation, and social and cultural integration of students in the host country, becoming either their greatest asset or one of the main barriers to communication in the academic context (see Keri et al., in press).

### 2.2. Secondary school learners' readiness for Erasmus+ mobility

Studies on secondary school learners are not extensive, but they highlight the role of language and intercultural competences, which strongly influence learners' readiness for Erasmus+ mobility. Aba (2019) points out that learners often lack confidence in their language skills, which can affect their willingness to participate in mobility programmes. This attitude may vary depending on the cohort being studied. Other studies confirm that intercultural education increases the readiness of secondary school learners by fostering adaptability and openness to new experiences (Kavasakis, 2020; Weltzer et al., 2014).

It has been argued institutional support, such as participation in *eTwinning* projects, can significantly impact students' readiness by strengthening collaboration between kindergartens, primary and secondary schools (de

 

Miguel Vallés, 2017). Furthermore, organising international events in schools informs secondary school learners about future opportunities and increases their readiness for international mobility (Lebduskova et al., 2020). Their attitudes towards professional mobility can be developed through educational programmes and games (Voropaev et al., 2021). Thus, as Weltzer et al. (2011) conclude, a lack of preparation for mobility affects both students and institutions.

## 3. Method

An online survey was designed to achieve the above objectives. Respondents were asked demographic questions regarding their gender and age. They were also asked about their study plans and which faculty they would attend. They could select more than one option, as at this stage of their education, they may not know their final decision. They were asked if they had participated in an *eTwinning* project, Erasmus Youth, or any other international cooperation between schools. Next, they were asked about the languages they knew. Then they were presented with a series of statements and had to decide how true they were with the use of the following scale: agree, somewhat agree, neutral, somewhat disagree, disagree. The statements related to their linguistic skills, future plans, intercultural competences, life skills and well-being. Based on the assumption that behaviour is determined by intentions, attitudes and subjective norms (Ajzen, Fishbein, 1980; Ajzen 1988, 2002) and Bandura's self-efficacy theory (1977), which suggests that confidence in abilities can determine a person's plans and decisions, a self-report survey was chosen as the research instrument.

Face and content validity were checked with English and entrepreneurship teachers of the respondents to ensure the learners' ability to answer the questions in English, their understanding of the language proficiency levels (B1, B2, C1, C2), and the relevance to the entrepreneurship class curriculum. To pilot the survey, two learners from another school were asked to complete it to check the relevance of the content. One of them suggested removing the questions about computer literacy, as they showed an underestimation of their digital skills, and the other learner agreed. The survey was seen primarily as a learning experience. Therefore, asking two learners for their opinion on the content helped to avoid an impression that the questions were irrelevant and that the respondents' competences were underestimated. They might feel belittled and disrespected, which could affect the results. However, from a methodological point of view, the procedure may seem controversial. The entrepreneurship class teacher supervised the distribution and use of the survey.

**Context and participants**

Two hundred forty-three secondary school learners from three schools in Warsaw, Poland, participated in the study. There were 61.3% female and 30.5% male, with 8.2% preferred not to disclose their gender. Their ages ranged from 16 to 17 years old. Very few had participated in virtual school cooperation. *eTwinning* was mentioned by 9.1% of the learners and Erasmus Youth by 12.3%.

## 4. Results

The results of the survey are divided into the following categories relating to: (1) language, (2) future plans, (3) cultural and intercultural issues, (4) life skills and well-being.

### *4.1.1. Language*

Learners were asked about the languages they spoke and how they assessed their proficiency in each language. All of them declared Polish as their mother tongue, with proficiency at C1 or C2 level.

Table 1 shows the results of the participants' perceived levels of proficiency. The foreign language they knew best was English, followed by French. German and Spanish, which were less popular among the learners.

**Table 1.** Foreign languages spoken by the participants with self-assessment of levels.

| Language | C1 | B2 | B1 |
|---|---|---|---|

 

| | | | |
|---|---|---|---|
| English | 35.8% | 57.4% | 12.3% |
| French | 4.1% | 9.5% | 23.9% |
| German | 2.1% | 1.2% | 10.3% |
| Spanish | 2.5% | 3.2% | 7.8% |

The learners reported other languages: Japanese, Greek, Ukrainian, Korean, Dutch, Italian, Swedish, Bulgarian, Arabic, Polish Sign Language, Chinese, Albanian, and Czech. They knew them at A1 and A2 levels.

As shown in Table 2, when asked about their language skills in academic and digital contexts, they also rated their skills as high. Almost all of them expressed a willingness to improve their knowledge of the language of instruction and the language of the country where they might study.

**Table 2.** Participants' views on languages.

| Statement | Agree | Somewhat agree | Neutral | Somewhat disagree | Disagree | Don't know |
|---|---|---|---|---|---|---|
| *My proficiency of the language of instruction in f2f and digital settings (usually English) is already good enough to study abroad* | 53.5%, | 30.5%, | 10.3%, | 4.1%, | 3.3% | 1.3%. |
| *I am willing to improve my proficiency of a foreign language in order to study abroad.* | 72.0%, | 21.0%, | 5.8%, | 2.1%, | 0.0%, | 0.0%. |
| *I would like to learn the language of the country if it is different from English (at least the basics).* | 67.9% | 21.0%, | 8.2%, | 2.9%, | 0.0%, | 0.8%. |

*4.1.2. Future plans*

Most of them (89.3%) planned to study abroad, while 10.3% did not. They indicated the following areas of academic interest: Languages 37.9%, Music, Arts and Theatre 30.3%, Technology and Computer Science 27.1%, Business and Administration 26.6%, Medicine 26.3%, Humanities 18.9%, Military and Police Studies 7.0%, Law 3.3%, Psychology/Sociology 3.2%. Some respondents mentioned: Agriculture, Aerospace, Fashion, Biology, Chemistry, Photography, Neurobiology, and Interior Design. Some of the respondents indicated more than one field, which could be justified at this stage of education. The results showed an uneven distribution of their interests.

When asked about studying abroad, they replied: Definitely yes 22.6%, Rather yes 27.2%, I have not thought about it 41.2%, Rather or definitely no 8.6%. It is significant that more than 41.4% had not thought about it, but it also shows how they learn as this statement appeared at the beginning of the survey. The participants who had not thought about studying abroad were able to answer the following more detailed statements about their possible stay abroad.

Table 3 shows that many of them planned to work abroad after graduation than studying abroad before. However, they were not sure about the excellence of their academic achievements, that would allow them to study abroad. They supported the idea that Erasmus+ mobility could contribute to their preparation for future work so they will check the possibilities when applying for higher education.

**Table 3.** Participants' opinions on their future actions.

| Statement | Agree | Somewhat agree | Neutral | Somewhat disagree | Disagree | Don't know |
|---|---|---|---|---|---|---|

 

| | | | | | | |
|---|---|---|---|---|---|---|
| *I would like to work abroad in the future, after finishing my studies* | 51.4%, | 23.5%, | 18.9%, | 2.9%, | 4.5% | 3.7%. |
| *I expect my achievements are good enough to apply for an Erasmus scholarship* | 16.0% | 33.7% | 29.6% | 11.9% | 1.2% | 10.7% |
| *Erasmus exchange would prepare me to work abroad in the future* | 44.4% | 29.2% | 16.0% | 1.6% | 3.7% | 5.8% |
| *When looking for a place to study in Poland, I would check whether they offer the possibility to study abroad within the Erasmus programme* | 37.0% | 31.7% | 18.5% | 3.3% | 4.5% | 4.8% |

*4.1.3. Culture and intercultural issues*

According to the research mentioned above (see 2.2), intercultural competence was the second most important issue for students. Table 4 shows that SSLs were interested in culture and had a positive view on their intercultural competence. They were also willing to interact with local and other international students during their stay abroad.

**Table 4.** Participants' opinions on cultural and intercultural issues.

| Statement | Agree | Somewhat agree | Neutral | Somewhat disagree | Disagree | Don't know |
|---|---|---|---|---|---|---|
| *I am interested in the high culture (history, art, music) of the foreign country to which I would go on an Erasmus exchange* | 38.7% | 26.7% | 19.8% | 4.1% | 8.2% | 3.7% |
| *I possess good intercultural skills when dealing with foreigners related to e.g. keeping distance, greetings, speech patterns, eye contact* | 28.4% | 38.3% | 22.6% | 5.3% | 4.1% | 6.5% |
| *I would like to meet peers from the country where I would be studying*. | 59.7% | 27.2% | 9.9% | 2.5% | 1.6% | 1.6% |
| *I would like to get to know peers from other countries*. | 54.7% | 27.6% | 12.3% | 3.7% | 0.8% | 1.6% |

*4.1.4. Life skills and well-being*

When asked about trips abroad, most of them indicated that they had travelled more than 5 times (82.7%), 4-2 times (12.3%), once (3.7%), never (1.2%). This may reflect the social status of their families.

Table 5 shows their perceptions of selected aspects of staying abroad in terms of resilience, coping with foreign food, unfamiliar weather conditions, and financial limitations. More than half responded positively to each of these aspects. However, loneliness was perceived as difficult to cope with.

**Table 5.** Participants' opinions on the life and well-being aspects of ISM.

| Statement | Agree | Somewhat agree | Neutral | Somewhat disagree | Disagree | Don't know |
|---|---|---|---|---|---|---|
| *I have a good orientation in unknown cities*. | 27.6%, | 31.7% | 25.1% | 9.5% | 4.9% | 2.9% |
| *I can understand the public transport system in a city abroad*. | 36.6% | 34.2% | 20.2% | 4.5%, | 2.5%, | 3.7%. |

 

| | | | | | | |
|---|---|---|---|---|---|---|
| *I am prepared to adapt to unusual weather conditions* | 51.6%, | 28.4% | 14.0% | 2.1%, | 2.1%, | 2.5%. |
| *I am willing to accept foreign food*. | 64.6% | 22.6% | 9.1% | 2.9% | 0.8% | 0.8% |
| *I am ready to acquire local leisure activities and entertainment practices*. | 48.1% | 35.8% | 11.5% | 2.9% | 0.0% | 2.0% |
| *I can cope with the financial limitations – as the scholarship only covers the basic accommodation and food*. | 33.7% | 41.6% | 15.2% | 5.3% | 1.3% | 4.5% |
| *I can get financial support from my family in case the scholarship does not cover my basic needs* | 48.6% | 32.9% | 12.8% | 4.9% | 0.0% | 2.5% |
| *I am afraid of being alone in a foreign country for a few months*. | 19.8% | 30.0% | 21.0% | 9.5% | 17.3% | 6.6% |

## 5. Discussion

English is taught in almost 98% of primary schools and 99% of secondary schools in Poland. It is the best-known foreign language. Either French or Spanish is popular as a second language in secondary schools. This means that these languages are studied for a shorter period of time. The other languages they mentioned, with the exception of Italian, are not official languages in the Polish educational system.

That is why, in contrast to Aba's findings (2019), the learners considered their English language skills to be quite good. The ENIS literature review of existing practices in international mobility shows that the main language problems occur in academic contexts and that language skills are the key factor that either facilitate or hinder the success and well-being of students in host countries. The respondents assumed that their language proficiency might not be good enough for studying abroad in both face-to-face and digital settings, which also supports Hessel's findings (2019). This is because they learn general English, which is more focused on exams such as the school-leaving exam or Cambridge exams. The Polish curriculum does not emphasise CLIL – Content and Language Integrated Learning, so the learners were less confident in the language skills needed in academic and digital contexts. However, they are willing to improve their language skills if necessary.

They were less confident that their academic achievements would be sufficient for Erasmus+ mobility. This can be considered normal and explained by their lack of knowledge and experience. They were only secondary school learners, not university students. Significantly, almost half of them had not yet considered studying abroad, although they had thought about working abroad after graduation. This indicates their lack of knowledge about the possibility of studying abroad. However, they quickly embraced the idea and responded to the statements about potential mobility that followed the initial question. Half of them were confident about their intercultural skills, basing this assessment on their trips abroad. However, the results show that they were able to identify the challenges of a long and demanding stay in a foreign country for academic purposes, which could affect their well-being.

They lacked practical experience of virtual collaboration at the school level with very few having participated in *eTwinning* or Erasmus Youth projects. This suggests that secondary-level educational institutions do not effectively encourage interest in Erasmus+ mobility, as very few learners have participated in any international exchange. They also do not provide opportunities to practice CLIL and intercultural competence in cooperation with peers from other countries. This confirms Weltzer's findings that lack of preparation for international mobility affects both students and institutions.

The human and educational aspect of this study are noteworthy. The survey had a significant impact on the 41.2% of the learners who had not previously considered Erasmus+ mobility. After the survey they became interested in the opportunity and initiated discussions about studying abroad among themselves and with their entrepreneurship

 

teacher. This can be seen as a step taken by the school to introduce Erasmus+ mobility to the learners. Their generally positive attitude towards the prospect of studying abroad may also be attributed to the healthy enthusiasm of young people for their future.

However, there is a small group of learners (5-15%, depending on the question) who disagreed with many of the statements or replied that they did not know what to say. They might need more time, experience, and information about the advantages and disadvantages of the Erasmus+ mobility programme. They might need more attention in terms of developing self-confidence and self-efficacy or dealing with challenges they might be facing at the moment.

The study has several limitations. Firstly, the learners were not asked about their digital literacy and confidence in using digital technology. This was because a pilot interview suggested that such questions could be perceived as insulting and patronising by the respondents. Secondly, self-report surveys may contain data whose credibility is difficult to assess. The researcher has to rely on the respondents' honesty. However, with the intention of exploring attitudes, such surveys remain useful instruments for data collection. This is especially true for young people who take part in the survey as part of their learning activities. It was estimated that they did not suffer from survey fatigue (Mol, 2017). Thirdly, although the sample is quite large, the respondents were collected from prestigious schools located in a large city. One of the schools was bilingual with French as the language of instruction. They were not randomly selected. Finally, the frequency of trips abroad and the expectation of financial support from the family indicate a fairly good economic status of the learners, which might not be the case for another cohort of respondents. All in all, the results cannot be representative.

## 6. Conclusions

The language skills constitute the main factor contributing to the student success in international mobility and considering the importance of early preparation for this opportunity the study conducted among secondary school learners shows that they were aware of the importance of general language skills. They assessed their level of proficiency in general English as high, but they perceived challenges in using the language effectively in formal academic contexts, including the digitalisation of university practices, and in social contexts during their stay abroad. In response to this challenge, they were willing to improve, building on the background they have already acquired. Besides, the secondary school learners were aware of other factors influencing their readiness for international mobility such as intercultural skills, adaptability to the new cultural traits in a foreign country and coping with life challenges. The learners, who had not considered studying abroad fast, acquired the new idea of mobility and continued investigating it after the survey.

The findings also showed that educational institutions did not provide opportunities for developing useful skills during the students' stay abroad. All learners deserve to be supported, regardless of their family status or current attitudes. Schools need to participate more actively in virtual exchange programmes, such as *eTwinning*, to provide learners with practical language and intercultural skills in international cooperation. This could be done through games as suggested by Voropaev and Sambur (2012). Such collaboration can be helpful in places where CLIL is not an essential part of the secondary school curriculum, as it promotes the integrated development of language, digital technology, and subject content.

It is worth presenting the perspective of opportunities to study abroad during language teaching more frequently. This can serve as a motivational factor for more intensive language learning at school and outside, with more focus on professional vocabulary. For example, a project on an imaginary application for a study programme abroad can focus learners' attention on this possibility. This can be relevant to B2+ and C1 language teaching, as it involves not only language development but also the acquisition of the necessary digital tools and forms.

Schools need to cooperate with Erasmus+ Mobility Agencies to actively promote the programme among learners; for example, by introducing the idea of student mobility among SSLs and by inviting former learners who have participated in this type of activity to share their experiences with younger colleagues. Early identification of learners whose self-efficacy and ability to foresee their future have not yet been developed can lead to a variety of

 

pedagogical actions to help them make better-informed decisions about their goals, what they want to do, how to set and achieve their own objectives.

Bearing in mind that not all students can participate in the Erasmus+ mobility programme, it is important to open this opportunity to secondary school learners to give them more time to decide. This may also increase the number of participants. Many learners show potential for Erasmus mobility, but they need support and encouragement from the institution. For example, language training with a focus on vocational aspects, raising awareness of the benefits and challenges of mobility, and focusing on their well-being are crucial to improving their overall readiness. Special care and attention should be given to less confident and reluctant learners.

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# Collaborative learning and CALL

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# Cross-cultural peer feedback in academic writing tasks: A virtual exchange connecting students in Sri Lanka with students in Spain

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***Abstract***

*Cross-cultural peer feedback has been shown to increase intercultural competence (IC) and cultural knowledge (Sarangapani et al., 2018), in addition to improving writing skills and language accuracy in a foreign language. This study investigates cross-cultural peer feedback in academic written assignments as part of a virtual exchange. Students in Spain (n = 39) were paired with students in Sri Lanka (n = 60) to analyze and provide corrective feedback using English as a lingua franca. The students were required to complete three writing tasks. Each of the tasks was peer-reviewed by the students' assigned group mates in the other country to correct the grammar and provide feedback before the final version was submitted for grading. The results show that participation in this project improved English editing and writing skills. The participants felt that their IC and foreign culture skills increased and generally felt that they would recommend this project to other peers.*

**Keywords:** *cross-cultural peer feedback; writing tasks; Virtual Exchange (VE); telecollaboration; Intercultural Competence (IC).*

## 1. Introduction

A virtual exchange (VE) allows students to collaborate and share information to solve complex, education-based problems (Sauro et al., 2021). When students collaborate in a VE, they are not only able to improve their language skills but also work on their intercultural competence (IC), and they advance their knowledge and communicative skills on the associated topics (Liaw & Bunn-Le Master, 2010). IC allows students not only to learn what is culturally appropriate, regardless of personal prejudices or preferences, but also to develop an understanding of how to use language to create connections with people from different cultures (Álvarez & Fernández, 2019; Belz, 2002, 2003; Ferreira-Lopes et al., 2018; Li & Dervin, 2018; Moeller & Nugent, 2014). Additionally, connecting students in a manner that allows them to collaboratively learn across cultures has been shown to increase critical thinking skills for local and global issues (Hsieh et al., 2017).

VEs can be used in a variety of ways in educational institutions (O'Dowd, 2018); however, when VEs are designed for classroom use, it is vital that the learners are engaged in the tasks for full collaboration and cooperation. When English is used as a *lingua franca* in a VE, the students not only learn about the content, but their foreign language

 

(FL) skills appear to increase (Manegre & Udeshinee, 2022). In the current project, a VE was designed for students to provide cross-cultural peer feedback to improve both FL reading and writing skills.

### 1.1. Cross cultural corrective feedback

Writing is one of the FL required skills, and the learning process for effective FL writing is time consuming since it involves organizing, planning, writing, and editing. From a learners' perspective, writing activities are often considered difficult and students may have decreased motivation and interest in these tasks (Rokhmah, 2020). Regardless of student perceptions of writing tasks, FL writing is a required skill for both educational and business purposes.

In the language learning process, students need to receive corrective feedback to identify their mistakes and improve their FL knowledge. Allowing students to participate in peer reviews provides them with corrective feedback that has been shown to improve their language accuracy, communication skills, and writing skills (Huisman et al., 2018). Further, when peer feedback is provided in the revision process for FL writing tasks, it has been found to be more effective than when writing new texts (Vuogan & Li, 2023). In addition to peer feedback for FL writing tasks, cross-cultural peer feedback has been shown not only to increase FL writing, but to also increase IC and cultural knowledge (Ferreira-Lopes et al., 2018; Moeller & Nugent, 2014; Sarangapani et al., 2018).

### 1.2. Objectives of the study and research questions

The objective of this study was to pair classes in Spain and Sri Lanka for the students to provide cross-cultural peer reviews on written tasks. Based on the background literature, it is assumed that the students would perceive their reading, writing, and editing skills to increase, in conjunction with learning about another culture. The research questions are as follows.

- Would participating in a virtual exchange for corrective feedback in writing be perceived as helping to increase foreign language writing and editing skills?
- Would the students perceive their foreign culture and ICC skills to increase through this writing project?
- Would the students enjoy participating in this project and would they recommend that others participate in this project?

## 2. Method

### 2.1. Participants

The participants of this study ($N$ = 113) ranged from 18 to 25 years and consisted of 69 students in Business English and nursing programs in Sri Lanka (NSBM Green University) and 44 students in an English degree program in the Catalan region of Spain (Universitat Rovira i Virgili, or URV). However, only the participating students who completed both of the questionnaires were used in the data analysis.

Regarding the linguistic backgrounds, the majority of the participants from Spain identified Catalan and Spanish as their first languages, while the participants from Sri Lanka identified Sinhala as their first language, and the English proficiency level of the participants ranged from A1 to C2. However, most of the students had a proficiency level in B2-C2.

### 2.2. Materials

The students used their own computers or tablets to write their assignments, and they uploaded their assignments in the university system on or before the deadlines (Moodle for URV). Additionally, at the beginning of the project, the students had virtual meetings, for which MS Teams was used.

 

The assignments were distributed directly to the students for peer feedback using institutional email, and the feedback for the assignments they were to correct was completed using a form created in MS Word.

### 2.3. Procedure

The students were randomly assigned into groups which contained two or five students from each university. At the onset of the study, the participants met their group online in Microsoft Teams. During this meeting, the participants introduced themselves and participated in some guided activities that aimed to help create an interpersonal connection between the students.

The students were told they would be required to provide corrective feedback on three written assignments for their students at the partner university. Therefore, the deadlines for the written tasks were on the date with the same topic. The topics of the assignments consisted of a short autobiography, a job application package, and an academic essay on the use of technology in education.

The participants would submit their first draft of an assignment. Then, the first draft would be sent out by email by one of the professors to their group mates at the corresponding university, along with the feedback form. Once the students received the email, they had one week to read and provide feedback on the written assignments of their peers and submitted their reviews on or before the deadline in their university system. The students would then receive an email from one of their professors providing them with the reviews of their first draft. They were then asked to revise their first draft, and they were given one week to submit this draft for grading.

The participants also filled out a pre-questionnaire and a post-questionnaire. The pre-questionnaire aimed to gather their background information. In the post-questionnaire, students detailed their experiences participating in this study by responding to Likert-style questions. Those experiences were related to their perception of the following topics: their improvement in their English language writing skills, changes to their editing skills, changes to their IC increase, whether they would recommend aspects of this project to other students or teachers, and their overall perceptions of enjoyment from participating in this project.

## 3. Results

### 3.1. Quantitative analysis

The responses to the questionnaire were first analyzed using Cronbach's alpha as a reliability or validation measure. Overall, there was high agreement between the items on the questionnaire with a Cronbach's alpha estimate of .952.

Then, the sum of each section was compared by group to see if there were any significant differences by group using independent samples *t* tests. The only significant difference between the groups was for the first section on writing ability. The students at NSBM Green University ($M$ = 18.78, $SD$ = 4.83) believed their participation in this project increased their written abilities at a greater rate than the students at URV ($M$ = 16.00, $SD$ = 4.22), and this was significant $t(71) = 2.59$, $p = .012$, with a medium effect size for Cohen's $d$ (0.61). For the remaining sections, there was no difference between the groups and, based on the validation test and the *t* test results, the students at both universities are considered to be responding similarly to the questionnaire and the summary of the responses can be seen in Table 1 below.

**Table 1**. Post-questionnaire descriptive statistics.

| Questionnaire Sections | *M* | *SD* | Maximum |
|---|---|---|---|
| Improvement in writing | 17.52 | 4.74 | 25.00 |
| Improvement in editing skills | 18.63 | 3.63 | 25.00 |

 

| | | | |
|---|---|---|---|
| Increased IC | 21.36 | 4.89 | 30.00 |
| Recommend that other students participate in cross-cultural peer feedback | 15.69 | 2.91 | 20.00 |
| Enjoyment | 18.38 | 4.41 | 25.00 |

### 3.2. Qualitative analysis

There were a couple of open-ended questions at the end of the questionnaire. The responses are as follows.

For the first question, asking the students what they would change with the project, since this was an optional question, several students did not answer this question. From the responses below, there were a few suggestions which could not be controlled, such as changing the dates of the task (restricted by the different schedules of the university), the time zone differences, degree programs, and personality-related conflicts.

While several students said they would not change anything about the project design and they were satisfied with the design of the study, there were a few responses that suggested that there should be more time allotted to online meetings and getting to know the other culture (see Table 2).

**Table 2**. Examples of open-ended responses to what the students would change about this project.

| Location | Response |
|---|---|
| Spain | Having another meeting with the other students without the teacher would have been better, as I felt I could not make a mistake while speaking. Even though we were working in groups, the activity felt individual because we had 0 contact with our partners from class. Travelling to that country would have also been awesome. |
| | It would be ideal if we could make some kind of common contact between all the members from a group, it was messy to send some things to the teachers, other to the members and other to just post on moodle. |
| | I would add more meeting times to get to know our peers better |
| | Instead of focusing that much about the writings I would add a task or project about the two different cultures so we can learn more. |
| Sri Lanka | We could improve more if we could collabarate more through more zoom meetings |
| | I believe I would've made it longer with more video conferences as we didn't have much "face-to-face" interactions |
| | If i could change something about the project i would like to meet them personally and work as a group. |

The responses to the second question were generally positive, and this was an optional question. Most of the students left the responses blank, but for the students that answered the questions, examples of their responses can be seen in Table 3.

**Table 3**. Examples of responses to whether there is anything else the students would like us to know about the project.

| Location | Response |
|---|---|
| Spain | It was a great experience! |
| | Not really. I would say that, overall, it was a great opportunity to share opinions and get to know each other and I'm so thankful with the people I met in this project. |
| | These sorts of activities are not usually my favourite, probably because meeting people online is not really my thing since it's often akward. This time, however, everything felt pretty relaxed and, at least in my group, everything worked out well (videocall and reviews). |
| Sri Lanka | It was a really good experience |
| | I'm really happy with this project |
| | I like this project. |
| | Overall it was fun and good. Thank you for this rare opportunity. |

## 4. Discussion and conclusions

The first research question of this project aimed to know if students thought that participating in a virtual exchange would help them increase their foreign language writing and editing skills. According to the results of the study, they perceived both their foreign language writing skills ($M$ = 17.52; Max. = 25.00) and editing skills (18.63; 25.00) to have improved over the semester. These results are similar to the ones obtained after the meta-analysis on peer-review (Vuogan & Li, 2023) and seeing that it provided early proof that peer review had a small to medium positive effect when learning a second language.

Regarding the students' perception of their foreign culture and IC skills, they reported that they learned more about the foreign culture and that their IC generally increased (21.36; 30.00), although there was only one online meeting in the project. This perceived improvement mirrors the participants in Manegre and Udeshinee (2022), who reported that they believed to have increased their IC skills. Furthermore, in that research project, students also increased their cultural knowledge, as could be seen in their questionnaires.

The participants in the study reported that they enjoyed participating in the project (18.38; 25.00) and would suggest other students take part in it (15.69; 20.00). The willingness to participate in VE projects can also be observed in Manegre and Udeshinee (2022), where Spanish and Sri Lankan students were part of a telecollaboration that aimed to achieve an improvement in IC skills.

The findings of this research show that participation in this project helped with the learners' editing and writing skills in English. Not only did the participants perceive an improvement, but they also felt that working on this project improved their IC and their foreign culture skills. The results and feedback from this project also indicate that participants would also recommend participating in this project to other students.

 

**Limitations of the study and suggestions for future research**

There were several limitations in this study, but they were all related to time. First, the time difference between Spain and Sri Lanka made meetings more complicated to organize. The meetings were held during the weekends and some afternoons due to the 3-hour and 30-minute time difference and the different students' schedules. Thus, the students in Sri Lanka had to work on the project in the evenings at a late time.

When it comes to organizing telecollaboration projects, having similar academic calendars is key. However, the semester schedules in Sri Lanka and Spain did not begin at similar times. While in Spain, the semester began the last week of September, in Sri Lanka, the semester began the first week of November. The project started in November, so the Spanish students had already been going to classes for some time, and the instructors were familiar with them, while in Sri Lanka the students started the telecollaboration project right when they started classes.

Another one of the limitations encountered was the time constraints that instructors and students went through. Since institution emails were used for the correspondence, it required a lot of the professors' time to send out the first drafts and the reviews. Having another online platform for this activity would have been much easier, but due to privacy concerns, it was not possible with the set-up of this project. It is recommended for future studies that an online platform that the students can access from both universities be used so that it decreases professor or teacher workload. Additionally, based on student feedback, it is recommended that the students have more online interaction so that they feel more connected to the students at the partner university. In addition, the students suggested that the topics for the writing assignments be related to their cultures, so that they may learn more about the culture of the students they are working with.

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# Students' perceptions of a video letter assignment in an asynchronous virtual exchange project

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***Abstract***

*Advances in technology have enabled students to interact more effectively in virtual exchange (VE) projects across institutions and countries. However, there are still challenges and barriers that need to be addressed (O'Dowd, 2023). This paper reports Japanese students' perceptions of a video letter assignment in an asynchronous VE project as their first experience of communicating using English and ICT. This preliminary study focuses on the video letter exchange which was conducted as an additional task during the project. The comments of the reflection sheets revealed that they were able to overcome some difficulties and learn through the video letter exchange. It was found that the video letter assignment in the VE project provided an opportunity to learn English expressions and other cultures, to experience differences with partners' cultures, and express their messages confidently.*

***Keywords:*** *virtual exchange (VE); digital storytelling; video letter.*

## 1. Introduction

The development of Information and Communications Technology (ICT) has brought about major innovations in education, particularly various changes in the field of language education. Numerous studies have demonstrated the benefits of Virtual Exchange (VE) projects (O'Dowd, 2021; O'Dowd & Dooly, 2022; Gruber et al., 2023). When combined with practices using digital storytelling and the creation of movie files in language learning (Sadik, 2008; Vinogradova et al., 2011), VE projects enable participants not only to communicate through text using a web bulletin board, but also to exchange video letters using an online video platform. For example, Flip is a free video discussion and video sharing app built by Microsoft for use in classrooms. Mango (2019) states that the online video platform is a valuable learning tool that enhances students' language learning skills.

However, it has been indicated that VE projects may still be difficult for students who are not very confident in English. It is also stated that in VE, students may be placed in situations that are unfamiliar to them or in communication situations that are beyond their current English proficiency level, and failures in VE can have a negative impact on students' confidence and motivation (O'Dowd, 2023).

Given these facts, this study aimed to investigate the practice of a VE project from the perspective of Japanese participants who were not very confident in their English. This paper reports perceptions of a video letter assignment in an asynchronous VE project as their first experience of communicating using English and ICT.

 

While the main activity of this VE project was text-based communication using an electronic bulletin board where participants posted essays based on three topics and other participants responded with comments on the essays, this study focuses on the exchange of video letters which took place as an additional activity at the end of the VE project.

The purpose of this study was to investigate student perceptions of the VE with partner students, using the following three research questions.

· RQ1: What did students learn by watching video letters from their partner students?

· RQ2: What did students learn by creating the video letter for their partner students?

· RQ3: Did students perceive that creating a video letter for the course project was a good learning objective?

## 2. Method

### 2.1. Project

The VE project called "Project Ibunka" is a web based VE which has been coordinated by Professor Masahito Watanabe since the year 2000. "Ibunka" means different cultures in Japanese, and the project has been giving English language learners from various countries opportunities to use English for authentic purposes and promote intercultural understanding (Watanabe 2020). As main assignments of the course and project, each student was asked to write essays on three main themes (school life, culture, and social issues/world peace) for discussion purposes. In addition, there was a supplementary task of creating a video letter at the end of the project. Students were supposed to create a video letter, and post it to an online video platform, Flip, where they were able to share videos with their partners and leave comments on each video.

### 2.2. Course and participants

This course was designed for Japanese university students in ICT-related departments who had little experience communicating in English with people overseas or were not very confident in their English proficiency but were interested in intercultural exchanges. Additionally, students understood that their increased commitment to homework and study time outside of class, compared with regular courses, would be required to learn about partners' cultures and think about social issues and peace together. This course had three goals: (1) to communicate with various people using English and ICT in a polite and respectful way, (2) to write their thoughts in English clearly with an understanding of basic essay structure, and (3) to create a video letter that was mutually interesting to partner students. All students had already carried out an activity in which they expressed their ideas in the form of digital storytelling in the previous English course in the Spring term of 2023 (April to July 2023). The Spring course was conducted in a similar manner to the course targeted in a previous study (Kasami, 2021), except that the themes of the assignments were more focused on social and cultural issues in preparation for the VE project in the Fall term. The course was conducted in a small group and seven students participated in the exchange project. The participants of this study were students majoring in ICT-related fields, and their English proficiency levels were estimated to be basic or intermediate (from A1 to B1 CEFR proficiency levels).

### 2.3. The video letter assignment

As a part of their work for the VE project, participants were asked to create a video letter at the end of the project. The link to Flip was prepared and participants could share video files on Flip. Participants were free to choose the theme of their video letters from a range of topics including campus tours, introducing one's life and local town, and interviewing friends and family. In the course of this study, the teacher gave the students the following instructions.

 

(1) To create a video letter within a short period of time (2 to 3 weeks)

(2) To create a video letter that would not make viewers feel uncomfortable and that would maintain interest

(3) Video letters could be created individually or in a group.

(4) A video camera would be provided by the teacher, and they shot a video of the campus during class (approximately 60 minutes), with additional work being completed outside of class hours.

Students were allowed to create video letters their own way. They decided to create a video letter as a group. During the 60-minute shoot, they did not record their voices, but recorded narrations afterwards by making use of the skills they had learned through the digital storytelling assignment in the previous course. They allocated each member a part of the video, and the group utilized their strengths to complete their sections within the deadline. Everyone's narration, photo and video files were compiled into one video that was approximately 5 minutes 30 seconds long. The content theme was a campus tour, in which seven students introduced their favourite places on campus along with their daily lives. During the campus tour, they introduced several facilities and familiar things on campus such as the library, cafeteria, computer room, recommended lunch menu, campus features and recreation on campus. In addition, one of the sutdents concluded with their impressions of participating in Project Ibunka 2023 and words of sincere gratitude to the partners.

### 2.4. Data collection

The source of data analysis was the comments on the review sheets and responses to the post-questionnaires.The review sheet was a single A4-sized Word file that was distributed and collected via the course LMS at the end of the course. The questions on the review sheets were as follows (The review sheet was conducted in Japanese.):

Q1. What did you learn at Project Ibunka 2023?

Q2: How has Project Ibunka affected your English studies?

Q3: What did you learn by watching video letters from partner students?

Q4: What did you learn by creating the video letter for partner students?

Q5: Please tell us about the positive and negative aspects of participating in Project Ibunka.

(Q3 and Q4 are focused upon in this study.)

The post-questionnaires were conducted at the end of the course and were created using Google Forms with a combination of closed and open-ended questions similar to the previous study (Kasami, 2021). This study focused only on the answers and comments to the post-questionnaire question items regarding video letters.

## 3. Results

Students were asked to reflect on the experience using the following questions. Questions and answers were conducted in Japanese. Below is the author's English translation of comments made by all participants.

### 3.1. Comments to RQ1: What did students learn by watching video letters from their partner students?

Figure 1 illustrates the students' comments to RQ1. Data source was comments for Q3 of the review sheet.

- "I was impressed by a video posted on Flip by a Brazilian student who was making brigadeiro (a Brazilian sweet). It was great to be able to share information about food from other countries in short videos like this. Also, watching this video made me want to try to make the sweet myself. "
- "In the videos made by other students, the slides were made in an easy-to-understand manner, and I was able to understand the content even if there were words I didn't know while listening. I learned that expressing what a presenter wanted to convey using visual aids made it easier for audiences to understand. Also, even in videos where the presenter was just talking (without visual aids), I was able to see what the presenter wanted to say by watching their facial expressions on

the screen. ”

- “Multiple students were uploading videos, of several minutes in length, to Flip for each theme. All the works were created well and fun to watch, and I was able to watch multiple videos without getting bored. In order to accurately convey their messages on themes to their listeners within a short time, they used various means such as images, videos, and gestures for communication. I was also able to discover that gestures are a tool used universally throughout the world. ”
- “I can understand what is being said to some extent through words, facial expressions, illustrations, etc., but I felt that in order to fully understand it, I needed to improve my own listening skills, and it would be better if consideration was given by adding subtitles when creating the video (to make it easier to understand when watching).”
- “I watched videos uploaded on Flip by XXXX (Japanese student name of another Japanese university is shown here as XXXX.) and learned that the ability to compose videos and the ability to summarize what you want to convey in English is important. Also, I felt that her English pronunciation and way of speaking were good, and her video was easy to understand.”
- “When it comes to speaking English, I feel that pronunciation and speed are more important.”
- “I learned that there are cultural differences between Japan and other countries, things that Japan has which don't exist overseas, as well as some similarities between Japan and other countries.”

Figure 1. Comments to RQ1: What did students learn by watching video letters from their partner students?

The students' comments revealed that there were two main benefits by watching video letters from partner students. First, they were able to learn how to convey their meaning effectively. For example, they realized that effective visual aids, easy-to-understand speech speed and volume, and gestures could help convey meaning. Second, they were able to learn about differences and similarities of their cultures and ideas.

### 3.2. Comments to RQ2: What did students learn by creating the video letter for their partner students?

Figure 2 illustrates the students' comments to RQ2. Data source was comments for Q4 of the review sheet.

- “I looked up the pronunciation of the words in my part carefully and practiced many times how to convey them clearly. This task gave me an opportunity to think about how people feel when they watch our video letter, and what kind of words are needed to convey meaning to others. Rewriting the sentences I had thought up by looking at them from a different perspective was important not only to improve my language skills, but also to enrich my understanding of other cultures.”
- “Although I had experience creating a video using English as part of a digital storytelling assignment in a Spring term course, this was the first time I had created a single video in a group. I had some difficulty in keeping good balance of the flow of the story and time allocation. Also, when I listened to the narration of other students' parts, I found that they used easy-to-understand English, spoke slowly to make it easier to understand, and each student had put in various ideas that would be useful in the future. I felt that I was able to learn some knowledge.”
- “I learned how difficult it was to communicate clearly about my university in English. By collaborating with friends from other departments, we were able to utilize each person's strengths in the work. This allowed me to create better videos. I learned that I can create better things by collaborating with others.”
- “We were able to create a video that would be understandable to people from different cultures and would not offend them. I found that thinking about the other person's feelings and interests is even more difficult during cross-cultural exchanges than usual (in-class interaction).”
- “I was able to create this video because I wanted to introduce my university to everyone in this project. I introduced our library, but as I thought about what I wanted to say, a lot of things came to mind that I wanted to introduce, so it ended up being a long introduction. Since my first essay was written in English to introduce myself, I often used the English sentences I had used at that time, and I felt that I was able to utilize what I had learned in class.”
- “Through this task, I was able to learn how difficult it is to summarize what I want to convey.”
- “I found it very difficult to do anything, even a short activity, in a language other than my native language.”

Figure 2. Comments to RQ2: What did students learn by creating the video letter for their partner students?

 

Students were able to learn various things by creating a video letter for their partner students. First, they were able to learn how to devise ways to communicate with others. They learned not only the necessity of language skills but also the necessity of understanding different cultures. Secondly, some students indicated that what they had learned previously was useful in this activity. For example, they were able to use the basic skills of English expressions and knowledge that they had previously learned to create this video. Third, some students noticed that by creating a video letter in a group, they were able to work together and produce a better video letter in a shorter amount of time than they could have done individually. Fourth, students found it even more difficult to take into account the other person's feelings and interests in intercultural interactions than in interactions with classmates. They gained learning opportunities by joining the VE project.

### 3.3. Responses to RQ3: Did students perceive that creating a video letter for the course project was a good learning objective?

The results of the post-questtionaire showed that from the seven students, five selected "(4) I think so.", and two students answered "(5) I think so very much." to the question of "Do you think creating a video letter for the course project was a good learning objective?". Nobody chose the options "(1) I don't think so at all.", "(2) I don't think so.", and "(3) Neither.". Overall, all the students answered positively in the video letter assignment (Figure 3).

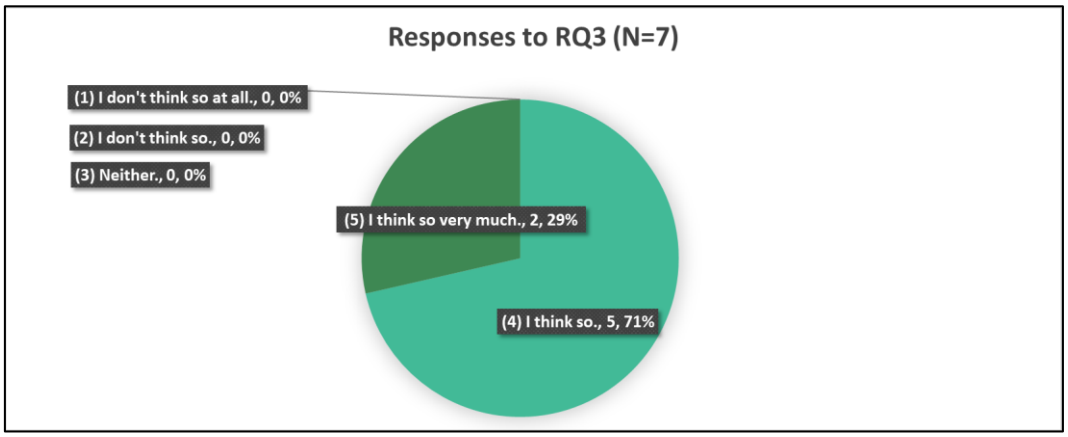


Figure 3. Responses to RQ3: Did students perceive that creating a video letter for the course project was a good learning objective?

An open-ended question in the post questionnaire, "Reasons for your answer to the above question ( "Do you think creating a video letter for the course project was a good learning objective?" What did you think was good or bad about it?)", was presented, and students were asked to respond to the question. The following are examples of comments: "At first I thought it would be difficult (to make a video letter), but when I actually made it, it was fun."; "The video production was fun, and the finished product was well-made." From these comments, it can be said that although they found the tasks challenging at first, some students seemed to overcome them and felt a sense of enjoyment and achievement by the end. The video letter assignment was perceived positively in general by students.

## 4. Discussion

Findings from the results indicate that the video letter exchange project enhanced the English and cuture learning experience of Japanese students. It was found that the video letter assignment in the VE project provided an opportunity to learn English expressions and other cultures, to experience differences with partners' cultures, and express their messages confidently.

 

Firstly, by watching video letters from their partners, students found hints on how to make effective videos. They included tips on gestures, pronunciation, voice volume, and speed that cannot be learned through text messages. By watching video letters created by students overseas, they were able to learn more from partners and gained insights that they could not have gained within the classroom. This aligns with the study by Hagley & Cotter (2019) emphasize the importance of foreign language learning becomes evident when a foreign language needs to be used in real communicative activities and tasks where authentic communication and collaboration processes are central to the interaction.

Secondly, by creating a video letter, students learned how to devise ways to communicate with others and felt a sense of accomplishment as they were able to work together to make videos while leveraging their individual strengths. While O'Dowd (2023) states that "asynchronous interaction allows those that may not be comfortable communicating in the language of the exchange time to prepare their messages and ideas, to review their language.", this case showed video-based letters also allowed for asynchronous communication. Even students who felt it difficult to speak fluently were able to take time to think about what they want to convey and prepare. In this video assignment, by using the skills they learned for adding narration to videos during digital storytelling in the previous term, it could become possible to create their best narrations after recording them multiple times.

Thirdly, they felt creating a video letter for foreign students was more challenging and required more effort than communicating with classmates in English, and they were able to experience the importance and difficulty of being considerate to various cultures at the same time. This is one of the valuable advantages of communicating with partner students. The students who participated in this study perceived the assignment as beneficial, which is in line with the findings of Dooly & Vinagre (2022), who indicate that most published studies on VE discuss the development of foreign language and intercultural competence.

According to O'Dowd (2023), VE projects that require a higher level of proficiency than one's own foreign language proficiency level may lower students' confidence and motivation. In this course of study, scaffolding of tasks and task preparation was conducted during the previous term. By allowing sufficient advance preparation prior to the actual VE, the students were able to participate with confidence even though most students' English proficiency was not as high as that of their partner students. Sufficient preparation and continuous student efforts were key to student success in not becoming overwhelmed by the assignment.

## 5. Conclusions

This preliminary study investigated Japanese students' perceptions of the video letter assignment in Project Ibunka. The result showed that they learned English expressions and cultures by watching video letters from their partner students.

The creation of the video letter also had an important benefit of recognizing the need for not only language skills but also the ability to understand different cultures in conveying a message to their partners. They realized that the English expressions and skills they learned before the VE project could be applied to the video letter assignment. In addition, they experienced and overcame difficulties in taking into account their partners' cultures and interests. Students in this study perceived that creating a video letter for the course project was a good learning objective.

In real-time interactions, students may not be able to speak English fluently, thereby making them feel anxious, which may even cause them to lose confidence, but they were able to manage and express their appreciation by conveying messages in video format. The video letter was created by making use of skills which they learned from the digital storytelling assignment. In digital storytelling, students were able to carefully consider their message, prepare a script, and record a narration to convey the message they wanted to convey, which increased their confidence in English. Therefore, since messages can be conveyed in video and their best performance saved, something which is not possible when messages are conveyed in real time, it can be said that communication through recorded videos could increase motivation for learning English if it is conducted with consideration.

 

The results of this study cannot be generalized due to the small number of samples. In addition, as the students were ICT majors chosing to take this course, the results may not apply to the general student population. However, the video letter assignment in the VE was received positively in this case where the assignments were scaffolded throughout the year and students had already experienced digital storytellng the previous term. The results suggest that the video letter assignment with partners provided students with valuable learning opportunities. They demonstrated their current English skills to the fullest through this task. Gratitude was the driving force behind their efforts. The support of their partners led to these positive results.

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# Distant learning and CALL

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# Engagement matters: Teachers' perceptions of and experiences with student engagement in an online EAP programme

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## *Abstract*

*The COVID-19 pandemic led to widespread closures of schools and universities, necessitating a rapid shift from in-person to online teaching, a novel situation for many second language educators. This transition raised concerns regarding student engagement given its acknowledged correlation with academic achievement. This study investigates how English for Academic Purposes (EAP) teachers perceived and experienced student engagement in an online pre-sessional programme at a British university and how they adapted their teaching methods during Emergency Remote Teaching (ERT). Employing a case study approach, qualitative data was collected from group discussions and individual interviews with 25 EAP teachers. The findings revealed that students engage differently online, requiring specific teaching strategies. Teachers reported higher student attendance, more equitable participation, and increased student responsibility in the online environment. However, they also highlighted challenges, including the ease with which students could disengage due to distracting home environments, their focus on assessments over learning, time zone differences, extended periods required for rapport-building between teachers and students, and technical difficulties. The study underscores the importance of teacher reflection on their online teaching experiences and suggests that awareness of digital pedagogy strategies is crucial for fostering engagement in EAP virtual classrooms.*

***Keywords:*** *online learning; emergency remote teaching; second language education; English for Academic Purposes; student engagement.*

## 1. Introduction

Engagement is key for meaningful learning to occur and is often regarded as an essential indicator of quality instruction. Student engagement has been strongly linked to attendance, grades, overall well-being, and academic success (Bergdahl, 2022; Fredricks et al., 2019; Zepke et al., 2014). In English for Academic Purposes (EAP) learning, engagement is crucial as it influences students' linguistic and academic achievement. Engaged students are more likely to actively practise the language, seek feedback, and immerse themselves in the linguistic, cultural, and academic contexts, resulting in improved academic performance (Hiver et al., 2024; Jiang & Peng, 2023).

In 2020, educational institutions worldwide transitioned to online teaching due to the COVID-19 pandemic, a shift termed Emergency Remote Teaching (ERT) (Hodges et al., 2020). Capturing students' attention and engaging them in meaningful learning from home posed a significant challenge for many educators. During this period, many teachers reported perceived limited or reduced levels of student engagement in their online classes (Kohnke

 

& Jarvis, 2021) or felt the need to reconceptualise student engagement within their teaching contexts (Toth et al., 2024). However, there remains a lack of research on online student engagement and its distinct nature from in-person[1] classrooms (Bergdahl, 2022; Martin et al., 2020), particularly in second language (L2) learning contexts. Studies show that teachers' experiences with student engagement can influence their responses, leading to different pedagogical approaches and student behaviours (Bergdahl, 2022; Bergdahl & Bond, 2022; Skinner & Belmont, 1993). Therefore, understanding how teachers experienced and perceived student engagement during ERT is crucial for enhancing our knowledge of student engagement in virtual environments.

The context for this study is a pre-sessional programme (PSP) at a UK higher education (UKHE) institution. PSPs are intensive EAP courses designed to prepare international students for university study by developing their English proficiency and academic skills. Offered by many UK universities, these programmes vary in length based on students' needs and language proficiency. The PSP in this study included courses that were 6, 11, and 16 weeks long, where teachers facilitate the development of academic speaking, listening, reading, writing, subject-specific academic and study skills, and familiarity with academic culture. Traditionally taught on campus, these courses were redesigned for online delivery and assessment during the pandemic. With the aim of understanding student engagement in the context of an online PSP in UKHE, this study aims to answer the following research question (RQ): How did teachers perceive and respond to student engagement when teaching EAP during ERT?

## 2. What is student engagement?

While most teachers may have a general understanding of what student engagement entails and its importance to learning, it remains a challenging concept to define (Reschly & Christenson, 2022a). As teachers, we often associate student engagement with observable behaviours, such as attendance, paying attention, showing interest, nodding in class, making comments or asking questions. This visible form of engagement reflects the notion of acting on one's initial motivation and actively participating in a learning activity (Hiver et al., 2021). Reschly & Christenson (2022b, p. 4), for example, define engagement as:

> Students' active participation in academic and co-curricular or school-related activities and commitment to educational goals and learning. […] It is a multidimensional construct that consists of behavioral (including academic), cognitive, and affective subtypes. Student engagement drives learning; requires energy and effort; is affected by multiple contextual influences; and can be achieved for all learners.

This **multidimensional construct** Reschly & Christenson (2022b) refer to has been much discussed in the literature (Hiver et al., 2024). Student engagement has been defined as a "meta-construct" (Zhou et al., 2021) that refers to the degree of attention, interest, investment, and effort that students exhibit in their learning. Fredricks et al. (2004) identifies the following dimensions within the student engagement construct:

- **behavioural engagement**: Active student participation in academic, social, and extracurricular activities, consistent attendance, completion of assignments, and involvement in learning tasks.
- **emotional engagement**: Positive feelings towards teachers, peers, content, culture, and the educational environment, including interest, enjoyment, and a sense of belonging within the learning community, fostering connections to the institution and its members.
- **cognitive engagement**: Investment in learning involving a willingness to put in the effort needed to understand complex ideas and the application of critical thinking to comprehend and use new knowledge.

Svalberg (2009) adds a fourth dimension to the student engagement construct that is key to L2 learning:

- **social engagement**: Interaction with peers and instructors, collaboration on learning tasks, and participation in discussions and group activities.

[1] The terms in-person and on-campus are used here interchangeably.

 

Fredricks et al. (2004) and Svalberg (2009) argue that these components are not isolated but dynamically interrelated within both the individual and the learning environment, with varying degrees of engagement across each component. For L2 learners, behavioural engagement ranges from completing assignments to actively participating in language clubs or cultural exchanges. Emotional engagement can vary from enjoying language learning to a deep appreciation for, or identification with, the L2 culture and community. Cognitive engagement can range from rote memorisation of rules to the application of self-regulated learning strategies that foster deeper L2 comprehension and proficiency. Social engagement can range from positive interactions with teachers and peers to practising L2 skills in real-world contexts. These qualitative differences within each dimension indicate that student engagement is malleable and should be measured on a continuum (Appleton et al., 2008; Fredricks et al., 2004; Hiver et al., 2021), and this has been done in various ways, including teacher evaluations, teacher and student perceptions, and self-report surveys (Fredricks et al., 2004). Notably, studies show that learner autonomy (LA), involving self-regulation, goal-setting, progress monitoring, and reflection (Benson, 2016; Zimmerman, 2002), positively influences behavioural, cognitive, and emotional (Jiang & Peng, 2023). However, only cognitive engagement seems to significantly impact academic performance, highlighting the importance of fostering deeper cognitive processes in online learning (Ibid.).

## 3. Engagement in online learning

In online learning environments, student engagement is perceived differently than in traditional classrooms. In in-person settings, teachers can easily gauge engagement or disengagement through visible signs, such as student active participation or lack of focus during a task. Teachers often sense when they have an engaged audience, but they note a significant difference when teaching online, particularly when cameras are off. As a result, traditional markers of engagement may not be as effective in virtual classes. Kennedy (2020) offers three key perspectives on understanding and promoting engagement online: interaction, interactivity, and learning design.

- **Interaction perspective**: This perspective posits that high levels of student engagement online rely on three different types of interactions: learner-instructor, learner-learner, and learner-content (Moore, 1989). Through this perspective, meaningful learning occurs through active participation, communication, and collaboration among students, instructors, and learning materials.
- **Interactivity perspective**: This perspective emphasises the importance of interaction when learning, suggesting that if the online learning environment is "interactive", it is engaging and beneficial for students. This involves using digital tools and platforms that support interactive elements such as forums, quizzes, and collaborative documents. It includes behavioural engagement (e.g. clicking, navigating, submitting) and cognitive engagement (e.g. deep thinking and working through the learning material).
- **Learning design perspective**: This perspective focuses on the systematic planning and structuring of educational experiences to enhance student involvement and participation. It considers how the design of learning activities, assessments, and environments can be optimised to promote engagement. Key components include active learning, scaffolded learning, real-world connections, diverse, flexible and inclusive learning methods, collaborative learning opportunities, and constructive feedback.

The latter perspective somewhat differs from the first two, advocating for a comprehensive learning redesign to foster engagement. Nonetheless, all three perspectives operate within the same framework for understanding and promoting student engagement in online environments. Indicators of engagement in online learning include the extent to which students utilise online spaces and interaction opportunities, their participation in asynchronous and synchronous discussions, and their questioning and commenting on concepts presented online. While students' behavioural interactions are more easily observed online, assessing the cognitive engagement driving these interactions remains challenging (Kennedy, 2020).

 

## 4. Method

A qualitative case study approach was adopted to investigate individuals' perceptions and experiences within a specific real-world context (Yin, 2010). This study considers a PSP and its teachers as the case study subject and their experiences and perspectives on student engagement as its object, as per Wieviorka's (1992) framework.

### 4.1. Participants and data colletion

All individuals teaching in an online PSP were invited to participate, with 25 EAP teachers agreeing to take part in this phase of the study. Data were collected through non-probability sampling between 2021 and 2022, using online discussion forums and semi-structured interviews. Most participants were female, aged 36 to 65, and identified English as their first language. Over half held a CELTA[2], and around half had a postgraduate degree or doctorate as their highest qualification. Five participants were coordinators, nineteen were teachers, and one was an academic lead, but all experienced teaching EAP during ERT. Except for one teacher, all participants had over ten years' experience teaching ESL or EAP in person, but none had taught groups online before the pandemic.

### 4.2. Procedures and data analysis

Participants received information about the research and data confidentiality, were given the opportunity to ask questions, were informed about their right to withdraw, and asked to sign the consent form. Their data were anonymised by assigning labels to their responses (e.g. T001 for teachers and L001 for leaders, i.e. academic lead and coordinators), and these are used in this paper to reference direct quotes. Data were analysed using Thematic Analysis as per Braun & Clarke (2006, 2013), inductively identifying and reporting themes in relation to the RQ. The findings are part of a larger study examining EAP teachers' experiences during ERT. As such, the results are not standalone and may not fully reflect the broader context or implications, potentially limiting interpretation.

## 5. Results and discussion

### 5.1. Online engagement is different from in-person

Participants initially perceived online engagement to be lower than in person. However, as the teaching progressed, two-thirds reported that engagement was different rather than lower. These differences can be analysed across four dimensions: multimodal interactions, ongoing interactions, contribution confidence, and democratic participation.

First dimension: **multimodal interactions**. Online interactions are inherently multimodal, mediated through various methods (e.g. text, audio, video, and images) and tools (e.g. video conferencing, discussion boards, and chat functions). Participant T003 observed that online engagement is more diverse than that on-campus, enabling a wider range of social interactions, as highlighted by Svalberg (2009), and promoting interactivity, as discussed by Kennedy (2020).

> Students were engaging online differently […] engagement is both synchronous and asynchronous […]. This mixture of modes allowed the strengths of different students to come across in different ways (T003).

Second dimension: **ongoing interactions.** Online interactions can be synchronous, with students engaging in real-time, or asynchronous, through VLE materials and other platforms. Online engagement includes ongoing interaction beyond the classroom, including asynchronous preparation and output, as exemplified by L004 below. This changes the timing and frequency of interactions and use an interaction perspective, as per Kennedy (2020).

> One thing I do in my own practice now is, at the end of the synchronous session, there's a tangible output. They're learning something, and they put it into action. […] something they share with others and is seen by

[2] Certificate in Teaching English to Speakers of Other Languages

> others as an output of that session. […] face-to-face, I never felt a proximity to the students once they left the room, and since going online, I feel closer to them when they're outside of the room (L004).

This quote suggests that the online format can enhance ongoing interactions beyond the virtual classroom, thereby strengthening both learner-instructor and learner-learner relationships. It also highlights a shift in practice, where students apply and share their knowledge outside the classroom, fostering a sense of community among students.

Third dimension: **contribution confidence**. Students appear more eager and comfortable sharing their work and ideas online than in person. This suggests that the online environment, which provides more time for reflection and composition, is perceived as less face-threatening, making students more at ease when sharing their ideas.

> There is more eagerness to post "this is my work", "this is what I think", rather than […] critiquing each other's work (L016).

Nonetheless, the pre sessional students in this study tended to present their own contributions without engaging in collaborative or critical discussions, which is a common challenge in online learning discussion forums, particularly in large courses (Gillani & Eynon, 2014). Transitioning to a more interactive and critique-focused culture requires ongoing effort and strategic interventions (Goshtasbpour et al., 2022; O'Riordan et al., 2021).

Fourth dimension: **democratic participation**. The online format may offer greater comfort for shy or introverted students. A common view was that online engagement is more democratic, as it allows students to interact with teachers, peers, and course content through different methods and modes, promoting greater equity. For example, students can engage in written and oral communication with the teacher and peers, both synchronously and asynchronously, extending beyond traditional classroom boundaries.

> Discussion threads provide students with a greater opportunity to engage with course content 'on their own terms': they now have more flexibility to reply to a thread post in a space and at a time of their choice - student engagement increases as it takes place beyond the confines of physical classrooms (L003).

In traditional settings, confident speakers can often dominate discussions, marginalising quieter or less confident students. Online platforms, however, offer tools that facilitate equitable participation, enabling all students to contribute regardless of their speaking abilities. This promotes meaningful engagement for quieter or shy students. The following participants emphasise the importance of providing varied modes of expression in the classroom.

> I have always been interested in allowing different modes of expression in the classroom so that those who are confident speakers don't dominate those who aren't, and online offers those different modes (L010).

> [Quieter students] tend to get drowned out in a classroom; whereas online, I always leave time for people to respond in the chat or on a Padlet, and that works really well (L014).

By providing alternative modes of expression, online PSPs can create a more inclusive learning environment. T003 suggests that online learning fosters a more egalitarian environment where all participants, including the instructor, appear at the same level, with no presence being more dominant than another. This equalises the visual presence and perceived status of all participants, potentially leading to fairer and higher levels of engagement.

> Their engagement was perhaps more democratic, in the sense that […] you are online, on the screen, and everybody's the same size, nobody is in a primary position, and that includes me. Everybody almost has an equal role or status, nobody's voice comes across as particularly loud, nobody has a physical presence that is greater than any other, and nobody's sitting at the front. All those kinds of things […] lead to a much fairer and maybe higher level of engagement across the group (T003).

### 5.2. No camera does not mean no engagement

Many teachers were initially frustrated by students not using their cameras in class, particularly in 2020; however, they learnt that this did not necessarily indicate disengagement. One-fifth of them did not view cameras off as a sign of disengagement. The assumption that students disengage when their cameras are off is a common

 

misconception rooted in traditional engagement measurements. While visible participation can indicate behavioural engagement or disengagement, it does not necessarily reflect students' cognitive or emotional investment in learning. Students may choose to keep their cameras off due to privacy concerns, appearance, confidence, internet limitations, or home environment, as exemplified by L004.

> [There is often an] assumption that students are in a comfortable space, that they feel emotionally able to put on their camera. […] when you're teaching people who are slightly younger, even go up to the early 20s, there's a lot of self-consciousness, and gender relation things […] like how males can appear on camera to compared to females. I've had interesting discussions with students […] where females would feel more judged for what their hair or skin looks like, or the environment they're in (L004).

In fact, a student's decision not to turn on their camera may help them feel more attentive and comfortable when participating in synchronous classes. L014 discussed this matter with her students, who agreed that not having their cameras on does not imply a lack of engagement with the lesson content.

> We read an article on the pros and cons of having your camera on in lessons. […] They all said there are just times where, you know, "I don't want to be on camera, because when I'm thinking I make a funny face", or "I don't want people to see me like that". But at the same time they said, "please don't assume that we're not doing the work if we're not talking or on camera, because I'm concentrating or I might be looking at vocabulary". So that was quite revealing for me (L014).

This quote highlights the nuanced perspectives of students regarding camera use during online lessons, acknowledging that students have valid reasons for opting out, such as feeling self-conscious or desiring privacy while cognitively engaging. Additionally, L014 further noted that silence might not equate to disengagement.

> When I'm teaching face-to-face, I use visual cues. […] If I ask a question to the class, I can see who looks confused. […]. Online, if people have their cameras off, suddenly, I didn't have those visual cues. How do I know If they want to respond? […] So I just started to sit back and wait for something to happen. […] And I've found that people do respond, even if it's in the chat, […]. It's definitely given me an insight into accommodating to different styles and just how long people need to formulate an answer. […] I've gotten a lot more out of students online from being patient and waiting for them to respond (L014).

This quote illustrates teachers' reliance on visible signs to gauge student engagement. The absence of these cues online initially left L014 uncertain about student responses and engagement. However, she adapted by waiting for students to respond. Her patience accommodated varied response styles and highlighted that students might need more time to formulate answers. T025 also provided an example where cameras off does not mean disengagement.

> I just couldn't figure out [why students had their cameras off]. Were they shy? Were they not interested? But when they came out of their shell and were able to communicate, I realized that they're just quiet and like to process things in their own time. I had a student who was quiet but in the speaking task she was outstanding! I was like, "why are you so quiet in the classroom?" And she's like, "I'm the type of student who doesn't really speak that much in the classroom, even in China. But I do my work" (T025).

These insights challenge the simplistic view that visual presence and talkative students equate to engagement. They highlight the importance of understanding students' individual needs and preferences and the necessity for flexible teaching methods to identify and foster engagement. Providing varied opportunities for participation in online learning environments is crucial. However, teachers may feel anxious about not seeing students and facing silence in the virtual classroom. Most L2 teachers who taught online during ERT likely prefer seeing their students on camera rather than just their profile icons. For instance, T024 observed different levels of student engagement in her pre-sessional groups in 2020 and 2021, attributing the differences to whether students had their cameras on.

> [In 2020], it was a shock because everyone had their cameras off. I missed talking to someone because it felt like I was talking to a screen all the time. But [in 2021], and I'm not sure why, everyone had their cameras on and that was really nice. It made a big difference and everyone was more engaged (T024).

 

T024 highlights the impact of visual cues on perceived student engagement. In 2020, the absence of students' video presence created a sense of isolation, making it feel as though she were "talking to a screen" and lacking the feedback and connection typical in on-campus teaching. In 2021, with students using their cameras, her teaching experience significantly improved, suggesting a correlation between visual presence and perceived engagement. However, a lack of visual engagement may indicate circumstances that warrant further exploration.

### 5.3. Engagement is dependent on learner autonomy

Three teachers suggested that student engagement in online learning is dependent on LA, reinforcing Jiang & Peng (2023) findings. In online environments, students need to take more responsibility for their learning, manage their time effectively, and stay motivated without the physical presence of a teacher, peers, or classroom structure.

> It's pretty much up to the student to take what they want to take from it. So, there is an element of student responsibility in this, you know? Autonomous learners are more engaged (L016).

For these teachers, LA is crucial for maintaining student engagement online by fostering self-motivation, active participation, and self-regulated learning. There is also a perception that studying online encourages students to become more independent and responsible for their learning. Below, T003 explains how teaching online can foster a more professional relationship with students, leading them to take greater responsibility for their learning and, consequently, their engagement in the programme.

> Certain teachers […] love the idea of an almost a maternal or paternal relationship with students […]. The fact that we're online, you can have the engagement that maintain the distance […] And if we're trying to get students to be autonomous learners, to think for themselves, to take responsibility for their own learning, behaviors, actions and development, I really don't understand how that being maternalistic [helps]. (T003)

This autonomy is crucial for effective online EAP development. Findings suggest that the online format may accelerate the development of learner responsibility when compared to on-campus. However, it is unclear whether this is due to the programme design, which required students to engage with VLE resources independently before attending synchronous lessons, or the more distant learner-instructor relationships created by the online setting.

### 5.4. Higher student attendance online

Teachers reported higher attendance in the online PSP, as noted by a coordinator: "Attendance has been very good, much better than when it wasn't online" (L014). International students in the UK are required to attend classes, meetings, and tutorials, submit coursework, and sit for examinations; failure to do so may result in the suspension of their studies and revocation of their visas (UKCISA, 2024). However, online attendance surprisingly exceeded that of on-campus students. This can be attributed to the flexibility of remote learning, which allows students to attend from different locations, accommodating varied schedules and eliminating commuting or travel barriers. Unlike on-campus students, who must manage tasks such as opening bank accounts, shopping, cooking, and adjusting to a foreign environment and language, online students studying from home face fewer new responsibilities, cultural shocks, and changes in identity and sociocultural values (Gu, 2009). Parental pressure may also play a role, as students often remain at home during the online PSP. Furthermore, the accessibility of course materials and communication tools online promotes continuous engagement, encouraging consistent attendance throughout the programme.

### 5.5. Reasons for student disengagement

Teachers shared reasons for student disengagement in the online EAP learning process. Key factors included technology issues, limitations of digital platforms, the prioritisation of assessments over in-class learning, insufficient learner-instructor rapport, inappropriate learning environments, and being in different time zones.

First, **technology problems**, such as connectivity issues, inadequate devices, or unfamiliarity with online platforms, were particularly mentioned as significant contributors to student disengagement

 

> Connectivity issues hamper communication and lack of immediate engagement and interaction (T015).

Participants also reported that the digital platforms and tools they use can significantly impact student engagement. For example, MS Teams restricted engagement by only displaying nine participants at a time and not allowing students to easily see and interact with each other, hindering physical classroom-like interaction.

Second, **prioritisation of assessments**. As the course progresses, particularly during assessment periods, students' priorities tend to shift markedly towards their assessments. While this was also observed in in-person classes before ERT, teachers noted that disengagement seemed more pronounced online during these periods. This suggests a transactional approach to learning, where the immediate demands of assessment overshadow in-class engagement.

> Towards the end of the course, students were less engaged in the class. [Their] priorities were the assessments. And obviously, they focus on this because that's the most important thing (T025).

This quote underscores the complexities of student engagement in an online setting and highlights the need to consider how course design can influence student motivation and participation throughout the learning process.

A significant number of teachers reported that building **learner-instructor rapport** online was more challenging, resulting in delays in creating a learning environment where students felt comfortable engaging.

> In-person engagement will always be different. The classroom setting and the fact the students know who is whom in the class play a significant role in the engagement that happens (T060).

> I had to put more effort to build rapport […] I still don't feel we connected to the same degree as face-to-face. […] When you see a physical person […], it probably makes a difference in engagement (T050).

Findings indicate a relationship between rapport, community building, and student engagement, aligning with previous research (see Culpeper & Kan, 2020). L004 exemplifies this by highlighting the importance of community for student engagement in the online pre-sessional programme – "It is harder to build trust and support networks in an online environment, […] which affects the overall community feel and engagement".

Fourth, teachers believe that the **learning environment** can influence students' engagement levels. One reason for this may be that students are in distracting environments, making it more difficult for them to engage in class.

> If they're not in the right environment at home, [you're] very distracted, you know? You're not distracted by your dog, or your parents giving you dinner when you're in a classroom (L004).

Another reason is the lack of physical presence of peers and teachers in online settings, which can create pressure for students to engage in class, as exemplified below.

> The problem with online is that if people don't engage, they really don't engage. […] so peer pressure is one factor. If there's someone in front of you talking to you, you will respond (L004).

> When I put students into breakout rooms, sometimes they didn't speak English. When they are in the classroom, I can hear immediately. And with my personal presence, I can stop that (T053).

Lastly, **time zone differences** posed a significant challenge. Most pre-sessional students were based in China, with an eight-hour time difference from the UK. This likely contributed to disengagement, as teachers taught in the UK morning, which coincided with night-time for the students. Consequently, synchronous interaction opportunities were limited, and asynchronous communication experienced longer delays, as illustrated by L003. Furthermore, classroom time coincided with evening family activities, further complicating students' ability to engage in class.

> There is a time factor to consider in that the Chinese students and the UK-based teachers can only interact directly with one another for a shorter period than obviously would be the case if students attended a face-to-face pre-sessional (L003).

 

### 5.6. Need for "new" engagement strategies

Given the perception that student engagement varies between online and on-campus settings, participants believed new teaching strategies were necessary for online instruction. EAP teachers responded by not relying solely on visual cues and chatty students, and instead, employed various teaching strategies, including:

- **flexible response time and formats**: Providing students with ample time to respond and permitting various response formats, such as synchronous or asynchronous text, audio, or video responses.
- **individual engagement:** Familiarising themselves with the students, their preferences and needs by engaging with them one-to-one or one-to-few.
- **student participation tracking**: Maintaining a list of all students and systematically ensuring diverse participation by ticking off names as they contribute in the synchronous class and asynchronous tasks.
- **direct questioning**: Engaging students with direct questions rather than open invitations to participate, fostering more immediate involvement and reducing prolonged silence in synchronous classes.
- **flipped learning method**: Utilising flipped learning techniques by requiring students to prepare before class, thus enhancing their readiness and confidence to participate during synchronous classes.
- **clarity of instructions**: Clearly defining tasks and objectives, specifying whether activities should be completed individually, in pairs, or in groups, before assigning students to breakout rooms.
- **rapport building**: Fostering a connection with students through various communication channels such as email, text, and video, and creating opportunities for informal interactions.

The ERT transition required a re-evaluation of engagement strategies to address the distinct challenges of the virtual PSP, and teachers' adaptation highlights a proactive approach to enhancing online student engagement. These strategies mitigate some limitations of traditional methods for fostering behavioural engagement online, while also enhancing emotional, cognitive, and social engagement. However, they predominantly align with Kennedy's (2020) interactivity perspective rather than with the interaction and learning design perspectives.

## 6. Conclusion

This study examined EAP teachers' perceptions and experiences of student engagement during ERT and its impact on their teaching practices within an online pre-sessional programme. Initially, teachers perceived online engagement as lower; however, findings revealed that engagement was not diminished but manifested differently. These differences included multimodal and out-of-class interactions, increased confidence in contributions, and more equitable participation. Results also indicate that students not turning on their cameras does not necessarily signify disengagement, as this choice can be driven by technical, personal, or social factors. Furthermore, learner autonomy emerged as an important factor for engagement, requiring students to self-regulate and motivate themselves online. Participants reported higher student attendance rates in the online programme compared to on-campus delivery, but noted challenges such as technology issues, the prioritisation of assessments over learning, difficulties in building rapport with students, and time zone differences, all of which impacted engagement. These challenges highlight the need for flexible teaching strategies to enhance online student engagement. Implementing these strategies is essential for creating an engaging, inclusive, and effective online learning experience, ensuring active student involvement and motivation. Such adaptations should address not only behavioural engagement but also foster deeper cognitive, emotional, and social interactions, as outlined by Fredricks et al. (2004) and Svalberg (2009). Overall, the study highlights the need for evolving practices to effectively engage students in online EAP education. These require educators to understand their learners and be proficient in digital pedagogy to support student participation and success in virtual settings, particularly as the demand for online pre-sessional programmes remains strong post-pandemic.

 

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# High-tech and low-tech environments in CALL

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# Enhancing language teaching with augmented reality: Insights from the ARIDLL project

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***Abstract***

*Augmented Reality (AR) enhances reality by incorporating digital elements, potentially improving the understanding of abstract or imperceptible concepts and problem-solving skills. Despite its potential, AR faces technological challenges and a lack of pedagogically-sound resources. In language education, AR offers multimodal environments that can boost motivation, engagement, and promote interactive and collaborative learning among peers. However, its adoption is limited due to insufficient AR literacy among teachers and a lack of resources. The Erasmus+ funded Augmented Reality Instructional Design for Language Learning (ARIDLL) project aims to address these gaps by establishing a professional community, providing AR training for teachers and instructional designers, and developing open educational resources. By utilising MirageXR, an open-source AR platform, the project facilitates AR integration into language teaching, fostering sustainable and innovative learning environments. This paper outlines the rationale for ARIDLL and showcases an AR activity developed for English for Specific Purposes. It concludes with a discussion of the project's next steps to ensure the creation of pedagogically-sound AR learning activities for language teacher communities.*

***Keywords:*** *Augmented Reality; language learning; interactive learning; instructional design; ARIDLL project.*

## 1. Introduction

Augmented Reality (AR) enables users to enhance their perception of reality by incorporating digital elements. It can also enhance physical items by adding digital and virtual elements, including superimposition (Di Fuccio et al., 2024). Virtual content can be displayed in two-dimensional or three-dimensional (3D) formats, depending on the intended user experience. An AR environment adds to reality rather than fully replacing it (Azuma, 1997). While various devices can run AR applications, such as mobile phones and smart glasses, the most commonly used devices are mobile phones and tablets. These devices offer all the essential functionalities, such as screens and computing capabilities, and are more affordable in many educational contexts than devices like smart glasses. The affordances of AR in education include its ability to create innovative visual representations that can enhance students' understanding of abstract and imperceptible concepts (Liono et al., 2021; Wu et al., 2013) and its benefits for students' problem-solving and spatial skills (Guntur & Setyaningrum, 2021). In recent years, there

 

has been a growing research interest in using Artificial Intelligence (AI) technologies in the design of educational AR platforms (Rangel-de Lázaro, 2023).

However, AR presents technological problems, cognitive load, and a lack of AR literacy. In foreign language instruction, technical issues can influence students' anxiety levels (Ebadi & Ashrafabadi, 2022), and visual elements in AR can distract young learners (Chen & Chan, 2019). Consequently, the learning outcome could be negatively affected. The use of AR technologies in schools can enhance students' learning experiences through experiential learning if certain principles, such as the Cognitive Theory of Multimedia Learning and Cognitive Load Theory, are applied (Pang & Cai, 2023). Although research has shown that AR can be beneficial, future studies need to determine when and how it enhances learning and teaching (Buchner & Kerres, 2023).

In language education, AR provides language learners with novel multimodal learning environments, including visually rich content and auditory and haptic elements. AR can be used in language instruction to enhance targeted language skills, such as listening, reading, speaking, writing, cultural awareness, and linguistic components such as phonology (for an overview, see Parmaxi et al., 2024). AR is recognised for enhancing learner motivation, enjoyment, and engagement in language education (see Parmaxi & Demetriou, 2020).

Studies have shown the potential of AR in these areas, though research remains limited. For listening and speaking, AR has been used in game-based learning environments to engage learners in peer-to-peer interaction (Valero-Franco & Berns, 2024). In reading, AR games adapted from storybooks can engage children and encourage problem-solving and social interaction, though comprehension outcomes remain similar to traditional methods. For writing, AR applications have demonstrated benefits in content control, structure, and motivation, particularly for low-achieving students. In addition, AR can foster cultural awareness by allowing learners to interact with historical contexts and characters, thereby enhancing their understanding of the target language's cultures (Parmaxi et al., 2024).

Despite these potential benefits, AR is not commonly used in language education. Many language teachers lack familiarity with AR's instructional and learning design mechanisms, which hinders its inclusion in their teaching repertoire (Kaplan-Rakowski et al., 2023). There is also a lack of available resources, including AR tools and off-the-shelf AR activities for language learners, especially for less commonly taught languages. Moreover, there is a dearth of AR methodologies for the purpose of language learning.

To address this gap and support practitioners, the ARIDLL project aims to establish a professional community to meet the demand for digital innovation in language learning through AR. The project's goals are to facilitate the use of AR in language teaching by offering content across multiple languages, proficiency levels and educational settings, enhance the skills of language teachers in using and developing AR educational resources and improve the overall quality of language education.

The main objective of the project is to enable effective language teaching with AR. To achieve this goal, we work on materials and recommendations for two distinct groups. We develop instructional design guides for language learning with AR to support language teachers who use this technology. At the same time, we create technical recommendations for the design of AR tools so that they can support language learning to guide software developers. Regarding the first objective, the ARIDLL consortium has already published a first instructional design guide (Parmaxi et al., 2024), offering recommendations and pedagogical reflection to teachers interested in using and developing AR resources. Regarding the second objective, technical recommendations for designing AR tools have been provided in the different workshops held by each consortium partner and will soon be made available to the international teaching and research community through our project website (https://aridll.eu/).

The initiative aligns with prioritising the improvement of digital readiness, enhancing educators' competencies, and stimulating innovative teaching practices. To support teachers, the ARIDLL team conducts regular workshops for language teachers and instructional designers on AR usage and content creation. The team also supports teachers in developing their own AR language learning materials tailored to educational levels and

 

languages relevant to their context. The consortium, consisting of seven universities and a primary school, works collaboratively to achieve these goals.

This paper presents an overview of the ARIDLL project and provides the reader with a concrete example of AR activities developed so far, highlighting the added value of AR and MirageXR for language learning.

## 2. Insight on the development of language learning content with AR

The development of educational content with AR is at the centre of the ARIDLL project and is currently developing various activities for teachers to use with their students. By developing open educational resources (OER) and practical guidelines for teachers, the project aims to create a sustainable impact, enabling the broader educational community to benefit from the project outcomes.

### 2.1. Content authoring tools in education

Digital content is usually created using specialised software applications called authoring tools. A subclass of such tools that allow developing content specifically for learning can be called educational authoring tools. These tools are often designed so that they can be used by teachers and learning designers, who often do not have advanced graphical design or programming skills which would usually be required to create learning content without authoring tools.

Educational authoring tools meet a wide range of teachers' needs, unlike apps that focus on a single learning objective, context, and learner profile. Authoring tools can promote collaborative design, and foster the formation of professional communities, which is crucial for the adoption of digital systems (Rodríguez-Triana et al., 2020).

Educational authoring tools allow creating custom learning activities, which positively impacts teachers' motivation to use such tools and increases the likelihood of long-term acceptance of digital technology (Mumtaz, 2006). Moreover, these tools produce adaptable activities, enabling open use where teachers can reauthor, improve, and reuse previously created learning resources. Educational authoring tools also offer a low-cost alternative to single-purpose software applications, enabling teachers to develop learning activities that are good enough without the need for expensive developers or designers (Murray et al., 2003).

The advantages of educational authoring tools come with some limitations. According to Murray (2004), authoring learning content is inherently challenging; authoring tools can address this complexity by focusing on a specific niche or limiting the complexity of what they allow to be built. Murray (2004) recommends a participatory design approach, which includes subject matter experts and learners in both the development of learning content and the design of authoring tools, which can help address these issues. In a more recent review study, Ahmad et al. (2023) report an overview of modern authoring tools and the types of content they allow to create, specifically focusing on simulations, serious games, and extended reality, including AR. The paper discussed the limitations of the current authoring tools related to the educators' level of control, the lack of tools for editing specific types of content, and the lack of or limited quality of end-user evaluations.

Interactive educational content for AR can also be created using authoring tools that specialise in this medium. However, two recent studies have reported that modern AR authoring tools still face several challenges that must be addressed.

Ez-zaouia et al. (2022) analysed a corpus of 21 AR authoring tools from industry and academia, concluding that none of them fully met the needs of teachers and that there is little guidance on how to design effective educational activities. To address this gap, the authors proposed a design space that consists of four dimensions: authoring workflow, AR modality, AR use, and content and user management. In the same article, a list of three recommendations on how to design educational AR activities is presented. It states that AR software developers should incorporate suitable pedagogical approaches to support educators in creating pedagogy-based AR

 

activities and engage with teachers to uncover pedagogical activities to support and accompany AR tools with guidance to design content.

Dengel et al. (2022) examined 26 educational AR authoring tools and found that only a few tools were well-suited for designing educational AR. Based on their findings, they recommended that developers evaluate AR toolkits within the context of specific hardware, conduct empirical user studies with teachers, and enable the creation of interactive AR experiences with minimal required programming skills.

### 2.2. Language learning scenario design for AR content

When it comes to designing language learning scenarios, teachers who are not familiar with AR tend to struggle to develop innovative and effective learning scenarios. Multiple studies report a positive attitude towards AR among language teachers and the need for obtaining practical and technical skills (Belda-Medina & Calvo-Ferrer, 2022; Perifanou et al., 2023).

As with any new technology, its use does not automatically guarantee better learning outcomes, as Valverde-Berrocoso et al. (2022) demonstrated in their recent systematic review. They argue that applying new technologies in education should be seen as a complex process involving hardware, software, learning methodologies, and context. This leads to the conclusion that the effectiveness of new technologies in education often depends on how they are used rather than what they are (Hubbard, 2023). Therefore, a certain level of digital literacy, or in our case the emerging 'AR literacy' is needed already at the scenario design stage.

Effective use requires in-depth pedagogical reflection on the learning objectives being pursued and the value a particular technology might have in achieving them. Yeung et al. (2021), in their review of the impact of educational technology on learning outcomes, report that technologies can be both beneficial and harmful. They further argue that the effect of technology on learning depends on the degree to which learners utilise its unique affordances. This conclusion is supported by Valverde-Berrocoso et al. (2022), who state that the characteristics of educational technology systems are a major factor affecting academic performance.

### 2.3. MirageXR in the ARIDLL project

The ARIDLL project uses MirageXR, an educational AR platform designed to create, manage, and deliver AR learning materials tailored to the needs of students and teachers. MirageXR does not require programming or graphical design skills to create new AR content, making it accessible for practitioners who want to develop AR resources. Developed and supported by a community of developers managed by WEKIT Experience Capturing Solutions, MirageXR involves various educational organisations and projects. The platform is actively developed and regularly updated with new features and improvements (see https://github.com/WEKIT-ECS/MIRAGE-XR/releases). The ARIDLL project helps define scenario requirements and pedagogical patterns in language learning. MirageXR's core is open-source, available under the MIT licence, a permissive software licence from the Massachusetts Institute of Technology, which promotes community-driven development. The platform is freely available on Google Play and App Store.

## 3. Learning activities

The consortium has designed and implemented several AR activities using MirageXR. The objective is to illustrate key features and development possibilities that MirageXR offers for creating AR content for language learning.

The activity described below is designed as an e-book and exemplifies the use of AR for English for Specific Purposes. It presents engineering students with interactive 3D models, including a combustion engine and its components (Fig. 1). When students interact with different parts, the name of each part is displayed, and an audio explanation of the processes in English is given. Learners can view the 3D objects from different angles by moving their devices. The objective is for learners to acquire specialised terminology and understand technical

 

processes. Students are then tasked with dragging and dropping the correct labels onto the corresponding object. A brief video showcasing the activities is available here: https://youtu.be/GZETzDBWPoE. Depending on the learners, the activity can be stand-alone or supplemented with worksheets to provide additional scaffolding. As a follow-up, we plan to employ virtual characters with AI features to provide learners with relevant information and support when learning about specific topics such as engine mechanics and others. This would require learners to articulate what they have learned, effectively applying the vocabulary and knowledge gained from the activity. The virtual characters will provide feedback on the quality of their explanations.


**Figure 1**. Example of an activity for English for Specific Purposes. (Illustration: Zafrul Huzail)

## 4. Conclusions and perspectives

The example presented in this paper highlights the potential of AR to create highly visual and interactive learning activities that can provide learners with pedagogically sound resources for language learning beyond the classroom. Further implementation of the activity with AI could offer opportunities to create more personalised learning experiences where students can practise their speaking skills by interacting directly with AI-powered virtual characters configured by the language teacher to adapt to their learners' profiles and proficiency levels (Godwin-Jones, 2023). In the field of language learning, this opens up unprecedented opportunities to extend oral language practice beyond the classroom through real-life-like interaction.

Despite the promising opportunities that AR and AI offer for creating novel learning environments, our experience from the ARDILL workshops held so far has shown that teachers still struggle with the pedagogical and technical design of effective AR learning activities, both with and without AI. To help teachers become more familiar and confident with the creation and implementation of AR content, the project will focus in the coming year not only on training teachers in the pedagogical and technical design of AR resources but also on sharing existing AR practices and resources with the teaching community.

Finally, the ARIDLL team plans to run several pilots with learners from different languages, proficiency levels and backgrounds to collect learner feedback to inform the development of future AR learning activities with MirageXR.

 

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# Establishing a VR club for language speaking practice

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***Abstract***

*Traditional classroom settings, especially with numerous students, are often characterized by an absence of speaking practice opportunities. Emerging technologies such as high-immersion virtual reality (VR) can offer authentic scenarios in which language learners can practice speaking with each other, native speakers, or artificial intelligence (AI)–assisted chatbots in a safe space. This paper reports on an initiative that established a VR club aimed at providing English as a Second Language (ESL) learners with additional speaking practice outside of class time. Thirty ESL students enrolled in the summer session at the Intensive English Language Learning Institute in the United States joined the VR club. The club met twice a week over three weeks—six times total—and gave students the opportunity to practice speaking in English using a VR platform, Immerse. This paper describes the steps taken to establish the VR club and provides practical guidelines, including a description of the necessary resources. Moreover, potential challenges and preliminary lessons derived from the initiative are discussed. This paper serves as a blueprint for language teachers, language centers, and stakeholders wishing to establish VR clubs at their own institutions.*

***Keywords:*** *Virtual Reality (VR); speaking practice; language centers; extracurricular language learning; VR club.*

## 1. Introduction

To achieve speaking fluency, average language learners may need up to 2,200 hours of practice depending on their native tongue and the target language (Foreign Service Institute, n.d.). Providing this amount of individualized speaking practice in a traditional classroom is challenging. To address the deficit, teachers can organize virtual exchanges or speaking clubs (Jauregi et al., 2020; Klimanova & Vinokurova, 2021). However, these initiatives are dependent on the time, availability, and patience of interlocutors. In addition, high-anxiety, low-achieving, or introverted language learners often struggle to participate fully in these types of programs. The shortfalls can be addressed using educational technologies such as smartphones, language learning apps, and online platforms, which offer personalized speaking practice. Yet, traditional educational technologies repeatedly lack authenticity. High-immersion virtual reality (VR) is an emerging technology that can provide a more authentic and engaging solution particularly when combined with AI-powered avatars (Thrasher et al., 2023). AI-powered avatars provide students with personalized speaking practice, enabling them to engage in realistic conversations without the pressure of interacting with human interlocutors.

 

The goal of this paper is to report on an initiative that established a VR club for English as a Second Language (ESL) learners' speaking practice. The paper begins by describing the steps taken to create the VR club and provides practical guidelines, including a description of the necessary resources. Challenges and preliminary lessons derived from this initiative are also discussed. The paper is intended to serve as a blueprint for language teachers, language centers, and stakeholders wishing to implement VR clubs in their own language programs.

## 2. Virtual reality technology for language learning

### 2.1. High-immersion virtual reality

High-immersion VR has been defined as "a computer-generated 360° virtual space that can be perceived as being spatially realistic, due to the high immersion afforded by a head-mounted device" (Kaplan-Rakowski & Gruber, 2019, p. 552). In high-immersion VR, users typically navigate and interact with the virtual environment by means of VR controllers (see Figure 1), which provide realistic, haptic feedback that enhances the degree of immersion experienced (Sadler & Thrasher, 2023). Several theoretical frameworks, such as the Cognitive Affective Model of Immersive Learning (CAMIL; Makransky & Petersen, 2021), have highlighted certain affordances of VR that can foster language learning, including embodied learning and kinesthetic engagement, realistic experiences in a broad range of environments, collaborative learning, authentic cultural contexts, enhanced engagement, and contextualized learning with multimodal support (Dede et al., 2017; Kaplan-Rakowski, 2024). These affordances allow language learners to practice various language skills in enjoyable ways while experiencing a sense of presence (Ye & Kaplan-Rakowski, 2024).

Figure 1. Students in the virtual reality (VR) club wearing Meta Quest 2 headsets and using controllers.

### 2.2. Speaking practice in high-immersion virtual reality

Traditional classrooms offer limited speaking practice opportunities mainly because providing such opportunities to numerous students is challenging. Moreover, many students have a speaking barrier induced by foreign language anxiety (FLA). This type of anxiety is detrimental to language acquisition and leads to fear of negative evaluation, making mistakes, or embarrassment. However, research has shown that VR can help language learners cope with FLA by providing a risk-free environment for speaking practice (Kaplan-Rakowski & Gruber, 2023; Thrasher, 2022). For instance, Kaplan-Rakowski and Gruber (2023) found that practicing public speaking in VR led to significantly lower anxiety levels compared with traditional video conferencing platforms, such as Zoom. The findings in Thrasher (2022) were similar in that language learners experienced significantly less anxiety, both self-reported and physiological, when practicing speaking in VR compared with face-to-face speaking sessions.

 

One key advantage of VR is the use of avatars, which can shield learners from the embarrassment of making mistakes (Thrasher, 2023). This anonymity encourages more frequent and uninhibited speaking practice, as learners may feel less judged than when their identity is known. Decreasing negative self-perception and perceiving VR as a safe space to make errors (Kaplan-Rakowski, 2024) are necessary to reduce FLA and improve language speaking opportunities.

Language learners can practice speaking with their peers, native speakers, or AI–powered conversational partners. VR technology can provide all the three constellations of speaking practice. Such versatility is useful, as interacting with a diverse range of conversation partners can enhance linguistic competence and cultural understanding. As often done in virtual exchanges, peers offer a collaborative learning environment where learners support and motivate each other (O'Dowd & Dooly, 2020). Native speakers provide authentic language exposure and cultural insights, facilitating natural language use. Meanwhile, AI-powered conversational partners offer consistent, patient practice without the fear of judgment, allowing learners to practice at their own pace and comfort level (Thrasher et al., 2023).

## 3. Virtual reality club for speaking practice

While the integration of three types of interactions (i.e., with peers, native speakers, or AI–powered conversational partners) within VR is possible, the VR club focused mainly on offering AI-powered conversational partners. This decision was made by instructors at the Intensive English Language Learning Institute who wanted to provide students with additional, personalized, out-of-class speaking practice in a low-stress environment. VR provides this necessary environment that is realistic but also allows students time to observe and think before producing language.

Despite growing evidence showing VR to be beneficial for speaking practice, VR technology is still unavailable to large masses of language students due to its cost. As of October 2024, the price of VR headsets ranged from $350 (Meta Quest 2) to $1,100 (Meta Quest Pro). Once headsets are secured, language learning applications also often require one-time purchases or annual subscriptions (Chun et al., 2022). The cost can limit the accessibility of VR to individual students and pose challenges to schools wanting to give students opportunities to learn with this technology (Kaplan-Rakowski et al., 2023). Practices of sharing equipment, through programs such as VR clubs, can be a more cost-effective solution to the problem. This paper describes the implementation of such a club at the Intensive English Language Learning Institute at the University of North Texas, USA.

### 3.1. Selecting the VR Language Learning Application

Immerse (https://immerse.online), a social language learning platform, was chosen as the VR application for the conversation club. Immerse was specifically designed for live language learning and allows students to take group lessons with their peers and a native-like language teacher in over 40 different virtual environments (e.g., a restaurant, a doctor's office) to practice their speaking skills in real-time. All of these environments are highly interactive to add realism to the learning experience and increase the sense of embodiment that students experience. For example, in the restaurant scenario (see Figure 2), students can walk around the scene, ring up each other's orders on the cash register, prepare meals in the kitchen, craft cocktails behind the bar, and pay for their orders with a virtual credit card.

 

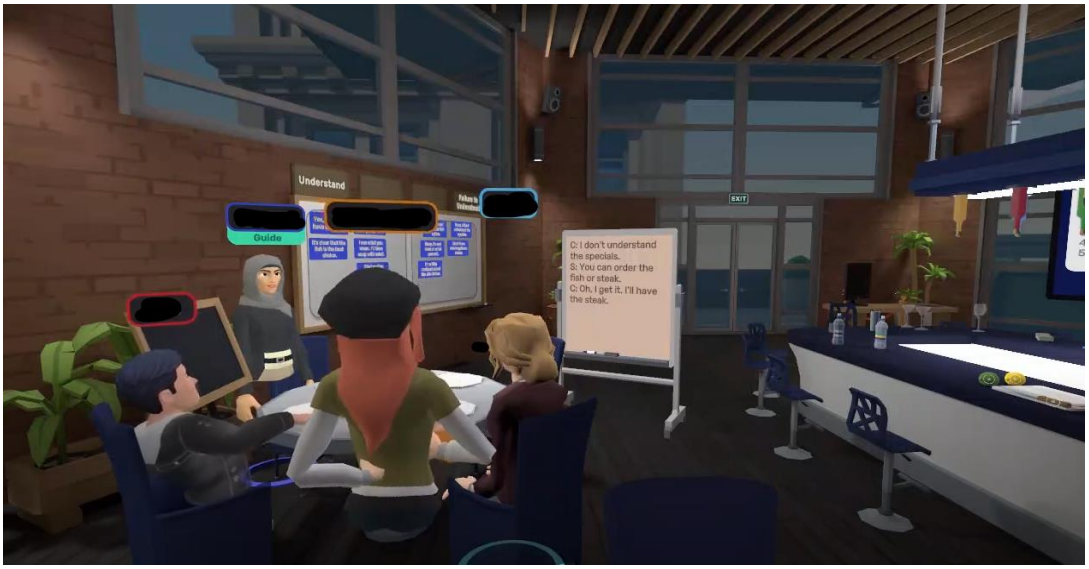


Figure 2. Students interacting in the restaurant scene in Immerse.

Students can access Immerse using either a standard computer or a VR headset (e.g., Meta Quest 2, Meta Quest 3, Meta Quest Pro). Students participating in the VR club used Meta Quest 2 headsets. Although Immerse is primarily designed for human-to-human interaction, the platform has more than 90 AI-powered role-playing conversations that students can do independently (Figure 3). The students in the VR club were given the opportunity to test both AI-powered conversations and live lessons with their peers in Immerse.


Figure 3. Artificial intelligence (AI)–powered role-playing in Immerse.

### 3.2. Planning for the VR club

To establish the VR club, the researchers collaborated closely with teachers and staff at the institute during the planning process. Logistic decisions had to be made regarding the location on campus for hosting the VR club and the schedule of meetups. The selection of VR applications and VR activities was also of key importance.

For the convenience of the students, the VR club was held in a classroom next to the main office of the institute and opposite the student lounge, which was a common gathering spot for students between and after classes. To maximize the potential for participation of students with varying schedules, the teachers and the research team decided on two sessions weekly, scheduled 15 minutes after the last classes at the institute ended. Because of

 

students' packed summer schedule and the limited availability of the researchers, the team decided that it was unrealistic for the club to meet more than twice a week.

Further discussion with the teachers was held to ensure that Immerse was a suitable application for the VR club. The students at the institute came from around the world with various academic and professional experiences and varying English language abilities. Because AI conversation partners in Immerse provide flexible practice that can meet students' diverse needs, this VR application was considered appropriate. The teachers and staff also tried Immerse in the role of a student to better determine its benefits and suitability.

### 3.3. Preparing Headsets and Equipment

Before the VR club started, the research team collaborated on the setup and preparation of the VR headsets. This process was completed before the headsets were delivered to the institute. As recommended by Thrasher et al. (2024), all the devices were enrolled on the same Meta account and within the VR headset management software ArborXR (https://arborxr.com). Thanks to this software, students could simultaneously access Immerse using an access key provided to the institute. The headsets also were connected to the university internet to perform necessary system updates and access Immerse. These processes were completed by the researchers three days before the first VR club meeting to ensure a seamless launch.

VR headsets are valuable equipment that need charging before each session, and transporting them before each session would be difficult. Therefore, the headsets were sent to the institute before the club started and kept locked in a storage room with other instructional materials. A staff member of the institute charged the headsets before each club session, and a chargeable cart was allocated to transport the headsets between the storage room and the classroom where the VR club took place (see Figure 4). One or two researchers were scheduled to arrive 30 to 60 minutes before the first club meeting to check the headsets and set up the classroom to ensure internet access and optimize headset placement. Starting from the second session, a few VR headsets were left charged but not turned on so that returning students could learn more about how to operate VR headsets, such as connecting to the school Wi-Fi.


Figure 4. Virtual reality (VR) headsets charging and loaded onto cart prior to club meeting.

### 3.4. Implementing the VR club

One week before the VR club started, students received information about the club through flyers and email. They signed up voluntarily, but walk-ins were welcome on any club day. One of the researchers also introduced the club to the students during lunchtime at the student lounge of the institute, where one student tried Immerse while others watched the real-time screen casting. This generated interest among students, as they were able to see the VR

 

application fully engaged. During the first club meeting, the researchers provided foundational technology training on VR with pictures (~10 minutes) and covered topics, such as adjusting headsets, setting up boundaries, and the functions of the hand-held controllers. Then, students accessed Immerse, completed the tutorial, and participated in AI conversations individually or with peers (30–45 minutes). Because new students came to each club meeting, this training was offered every time but returning students could skip it. At least one researcher and one teacher from the institute was present at each session to help with troubleshooting, while more experienced students helped each other. Figure 5 illustrates how the VR club was structured. Figure 6 shows students participating in the training.

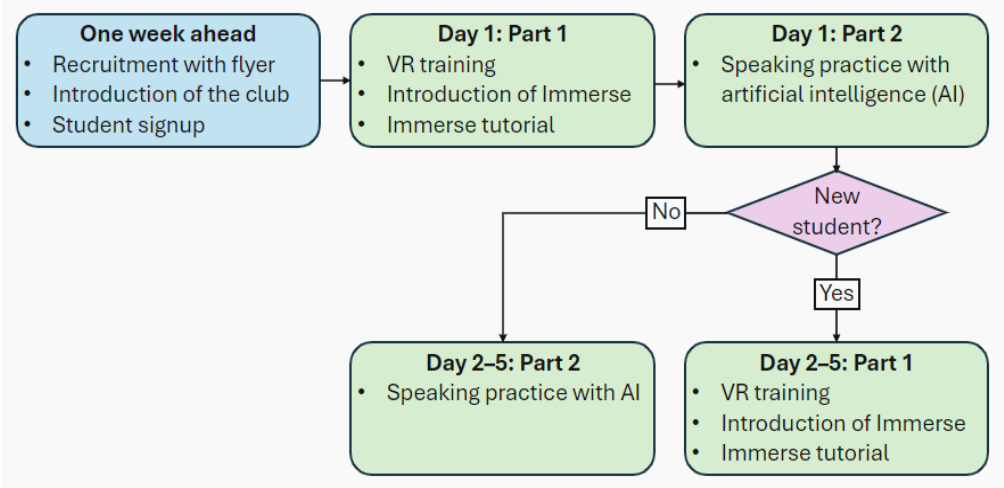


Figure 5. Virtual reality (VR) club procedure.

Figure 6. Students participating in virtual reality (VR) training.

## 4. Benefits and challenges of the VR club

At the end of the three-week implementation, the researchers conducted semi-structured interviews with the instructors and staff involved in organizing the VR club. These interviews, as well as observations of the club meetings, illuminated several benefits and challenges that accompany creating a VR club for language practice.

 

### 4.1. Benefits

A key advantage of organizing the club was that it allowed students to share equipment for self-regulated practice, which VR can foster. Most students reported that they enjoyed the interactivity of VR, while one student said that she learned other information from the AI practice in addition to language skills. The enjoyable and productive experience encouraged some students to return to the club to practice their English. Socialization was another factor that attracted students to the club. While some students came alone, others came to practice and play learning games with friends. This social feature of Immerse encouraged collaborative learning. A questionnaire to gauge students' perceived effectiveness, affect, and learning was also sent out after the last session of the club to gather students' perceptions about learning in VR. Unfortunately, only five students completed the survey, providing too little data for analysis.

Interviews with the program staff also revealed several benefits of using Immerse. The program staff highlighted the interactive nature of the platform. Kate[1], a student and program specialist at the institute, said that "it was really interesting that the world around you [the 360° experience] is interactive." The staff members echoed what was observed by the researchers during club meetings: that students found the interactive, social nature of the program to be engaging and exciting for language learning.

Regarding the AI role-playing which students engaged in for speaking practice, the staff members found that it was intuitive, and they were able to accurately evaluate what students said during conversations while guiding them through specific tasks, such as discussing favorite activities. For example, Kate commented on the role-playing: "[T]hey would have goals, or like checkmarks, for things to do or how to respond [see Figure 3] …. I thought it was really intuitive. That they actually know what I'm saying" (July 23, 2024). Cecile, an ESL instructor at the institute, noted that the AI role-playing gave students the chance to have a more authentic conversation:

> It's helpful because like when they're talking to each other in class, they're talking to another English language learner who isn't gonna have perfect grammar. Who may not perfectly understand them, but the AI does …. In a sense, they get to almost like, talk, interact with a native speaker, so to speak. And get correct input and also it can tell them if they don't understand or not. (Cecile, July 26, 2024)

Moreover, although the AI conversations were sometimes about topics that students had not yet studied, such as describing the environment, the program staff still found them valuable for students' speaking practice. They noted that certain features, including dictionary and response suggestions, built into the Immerse platform scaffolded the conversation for students. Kate, for example, said that "they'll give you suggested answers [for the conversation]. So even if it is something that they [students] don't know yet, they can get a preview of it. I definitely think that the exposure in general is pretty important" (July 23, 2024).

The researchers also asked the program staff members and educators about their key takeaways from launching a VR club. In her response, Kate noted that it is "not too much work. I really enjoy being able to work with the students and love it when they're like 'wow!' and navigating through it …. [F]or me, it takes maybe 10 minutes to get them [the VR headsets] all plugged in …. [D]epending on how many students we have, [it takes] maybe like 10 to 15 minutes to get everybody in the actual game [Immerse]" (July 23, 2024). Upon reflection, Cecile discussed how the VR club allowed the institute to achieve its goal of offering students additional speaking practice that cannot easily be provided during class time, saying that "sometimes, we have student assistants in class, but not all classes and there's only like one assistant per class, so they [students] don't really get a chance to talk to a native speaker and see that they're being understood" (July 26, 2024).

### 4.2. Challenges

Along with benefits, challenges (training, staffing, scheduling, etc.) emerged during the establishment of the VR club. The researchers observed a potential challenge in staff training similar to previous studies (Fransson et al., 2020). Only unofficial, needs-based training was offered to staff on headset preparation because researchers with

[1] Pseudonyms are used for all teachers and program staff.

 

more expertise were tasked with most of the preparation and implementation. However, staff members at the institute displayed varying knowledge of VR and diverse abilities in operating in Immerse. Therefore, to increase the chance of success, schools establishing VR clubs may need to invest in formal staff training on VR headset preparation and operation.

Moreover, the self-regulated nature of club participation calls for support from multiple staff members that may exceed the school's capacity. Kate confirmed the researchers' observation, stating that "[o]ver the course we had a couple [of students] returning, but for the most part, most of the days we would have brand new people" (July 23, 2024). Students' experiences with other technologies can further divide students in their progress. In fact, Kate considered it the biggest challenge: "You can almost immediately see the people who have ever played a console game versus people who don't at all. That's probably one of the biggest ones as far as actual setup …. The pace per each student definitely varies on a pretty, pretty big scale. So learning how to kind of get everybody on the same level would probably be one of the first hurdles" (July 23, 2024). Unfamiliarity with VR can also cause anxiety, and "some of our younger students were a little bit more scared because it [the VR headset] might not be the most attractive thing" (Kate, July 23, 2024). During the VR club, researchers and staff often needed to split their attention to meet students' diverse needs caused by this difference in their knowledge of and experience in VR. This situation can pose staffing challenges to schools organizing VR clubs. However, support and encouragement from peers during the VR club suggested that involving and training students to run VR clubs can be an effective solution.

As an extracurricular activity, VR clubs are also subject to school schedules and events. In this project, three of the club sessions coincided with the institute's finals, leading to schedule changes to the club, resulting in two meetings being canceled as students opted to devote additional time to studying for their exams. Cecile also noted that students perceived the club as an extracurricular activity, as more "fun", and preferred to play language games in Immerse over engaging with more "work"-like learning content such as the AI role-playing. She reflected on the fact that the institute had named the VR speaking program initiative "VR Club," saying that this could have been the reason students did not take the program very seriously. Moving forward, she argued that the VR initiative would be more successful if it were not referred to as a "club," explaining that "it's supposed to be [fun], but it's also supposed to be learning, and so I wonder if we should just call it like VR class or VR practice or something. Change the name a bit" (July 26, 2024). Moreover, Cecile noted the importance of incentivizing students to participate, saying that moving forward "we would probably have to incentivize them to do it either through extra credit or make it a homework grade or something that they go in and do X amount of time in the program because since they're seeing it more as work, we might have to treat it that way instead of something we could just expect them to do on their own" (July 26, 2024).

## 5. Conclusions

This initiative aimed to explore the dynamics of VR speaking practice among English learners in an after-school club—a semi-structured, self-regulated setting. The engaging and social nature of the VR environment attracted students to the club and promoted language learning. Moreover, in the AI-powered VR practice, students could participate in realistic yet supportive conversations. The AI partners in VR can involve students in goal-oriented dynamic conversations in comparison with classroom speaking practices, which often follow stricter structures. Meanwhile, when struggling, students can receive in-time support during the conversation in VR, which is not always available in real-life situations. Organizing a VR speaking practice club can also lead to challenges, such as training, scheduling, and participation focused on enjoyment. Student participation in a VR club may require more trained staff or student assistants than regular classes. Moreover, various school events may interfere with a club's schedule, which demands more communication and coordination. The schedule and nature of a VR club may also impact students' expectations of it, and extrinsic motivators may be necessary to encourage them to stay involved in such work-like activities. In conclusion, although a VR club can be beneficial to language learning and speaking practices, systematic planning involving different departments of a school is necessary for its success.

 

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# The potential of VR-AI-assisted personalized adaptive simulations for teacher training

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***Abstract***

*The combination of virtual reality (VR) and artificial intelligence (AI) technologies presents novel opportunities in teacher training. Pre-service teachers (PSTs) often face challenges in transitioning from theoretical knowledge to practical application in real classrooms. Integrating VR with AI to create immersive and adaptive simulations can bridge this gap by offering personalized practice environments that can be engaging and pedagogically effective. The purpose of this paper is to outline the potential of VR-AI–assisted simulations for PSTs' training in general, with a specific focus on their use in foreign language education. The paper discusses examples of currently available VR applications, explains how AI can provide interactivity and immediate feedback to PSTs, and how the integration of AI in VR classroom simulations can be used to train PSTs of foreign language education. We highlight both benefits and existing challenges of VR-AI–assisted simulations to foster a constructive discussion on shaping new avenues in PSTs' training.*

***Keywords:*** *virtual reality (VR); artificial intelligence (AI); VR-AI–assisted simulations; teaching simulations; pre-service teacher training.*

## 1. Introduction

Practical teaching experiences are necessary for pre-service teachers (PSTs) to complement their theoretical education (Darling-Hammond et al., 2005) and create opportunities to develop core practices (Grossman, 2018). Opportunities of PSTs to gain teaching experiences predominantly include approaches such as class observations, microteaching, and student teaching in a school practicum (Becker et al., 2019). Some limitations of these traditional PSTs' practical training are passive engagement in observations, mentor dependency, and short duration in student teaching. Technology-based teaching simulations such as those using virtual reality (VR) offer affordances that can reduce deficiencies associated with traditional teacher training approaches (Christensen et al., 2011).

The affordances of high-immersion VR include the sense of presence and embodiment. In the context of language learning, and especially pragmatics, the authenticity, contextualization, agency, and safe space of VR may be particularly useful (Kaplan-Rakowski, 2024). When combined with artificial intelligence (AI) technology, VR simulations may revolutionize teacher training approaches through realistic and interactive scenarios (Huang et al., 2021), allowing PSTs to practice teaching without the need for relying on human teaching supervisors, peers who typically give them with feedback, and access to classrooms. Especially in the context of foreign language

 

(FL) teacher education, combining VR with generative AI has substantial potential to foster both PSTs' pedagogical competences and language competences through spontaneous interactive communication with AI-based avatars. Although VR-AI–assisted teaching simulations are not intended to replace practicum, they should be considered as a valuable supplementation to PSTs' practical training.

This conceptual paper is part of a research project empirically investigating the impact of high-immersion VR combined with AI technology on foreign language PSTs' training (see Pitura et al., 2024). The main purpose of this paper is to discuss the potential of VR-AI-assisted classroom simulations for personalized adaptive teaching practice in the context of foreign language PSTs' training. We outline how VR-AI-assisted classroom simulations can be used to foster PSTs' foreign language competences, professional knowledge, and self-efficacy of teaching in a safe and low-anxiety environment. Moreover, we present examples of VR applications facilitating such practice, pinpointing current challenges associated with VR-AI–assisted simulations and proposing ways to overcome those challenges. Future directions conclude the chapter.

## 2. Virtual reality and artificial intelligence explained

### 2.1. Virtual Reality (VR)

High-immersion VR refers to "a 360° virtual space, either computer-generated or created by 360° video technology, that is perceived as spatially realistic due to the high immersion and embodiment provided by a head-mounted device" (Kaplan-Rakowski, in press). Situated within the framework of the Cognitive Affective Model of Immersive Learning (CAMIL; Makransky & Petersen, 2021), high-immersion VR fosters a sense of presence (i.e., "being there," in the virtual environment) and a sense of agency through three technological factors that are unique compared with two-dimensional (2D) displays: immersion, control factors, and representational fidelity. These aspects make high-immersion VR especially beneficial for learning and transfer into real-life settings through increased motivation, self-efficacy, and embodiment (Makransky & Petersen, 2021). The VR technology is suitable for teaching complex tasks and procedural knowledge, which are essential for PSTs' training concerning the development of practical teaching competences.

### 2.2. Artificial Intelligence (AI)

Artificial intelligence is a technology aiming to simulate human intelligence, enabling autonomous and efficient performance (Holmes et al., 2019). AI can be classified as weak or strong. Weak AI uses models that are pre-trained, thus recycling pre-existing solutions. Conversely, strong AI uses models that encourage the generation of new solutions. Although AI has been integrated into educational contexts for decades, the 2022 surge of generative AI tools, such as ChatGPT, has enabled a more extensive implementation of AI technologies (Lampropoulos et al., 2024). This development has facilitated the integration of AI into platforms such as VR, enhancing the potential of combining these technologies across various domains, including teacher training.

## 3. VR-AI–assisted simulations for PSTs' training

Integrating AI in VR simulations emerges as a novel way to supplement teaching simulations that have been a popular approach in PSTs' training since the early 2000s (Ledger et al., 2024). Teaching simulations have typically focused on aspects of general teacher training, for example, classroom management (McGarr, 2021) and addressing students' emotional needs (Huang et al., 2021). Such simulations can be beneficial for PSTs because, in contrast to practice in real classrooms, they allow for repeated practice of specific situations (Billingsley et al., 2019). Research in teacher education has increasingly used VR for simulations (Huang et al., 2021) to increase the realism resulting in higher training outcomes. Historically, teaching simulations have been conducted using low-immersion VR, which is experienced on a 2D monitor. *Mursion* and *SimSchools* are examples of 2D teacher training simulations, serving as controlled and safe spaces in which PSTs can make mistakes without consequences (Cowin et al., 2020). Other low-immersion VR applications for classroom simulations are *TeachLivE*, *OpenSimulator, SecondLife,* and *Classroom Sim* (for an overview, see Ledger et al., 2024). Typical elements of low-immersion VR teaching simulations are outlined based on the example of *SimSchool*.

 

*SimSchool* is advertised as an environment with "SimStudents [who] have artificial emotional intelligence. They smile, cry, become frustrated, raise their hands, seek attention, and show signs of stress. They respond in very individual ways to tasks assigned, tone of voice used, and to classroom management strategies employed" (simEd LLC, 2024). Despite this advertisement of *SimSchool's* incorporation of AI, its implementation has been limited to weak AI, which is restricted to preexisting patterns based on students' individual profiles, resulting in less adaptability (Christensen et al., 2011). Moreover, interaction is only possible via text-based chat in pre-programmed teaching scenarios (Lee & Ahn, 2021). Two main limitations of *SimSchool* (and similar 2D teaching simulations) exist. First, these simulations solely employ text-based weak AI, which neither generates new content spontaneously, nor allows for free-flowing oral conversations of teachers with the virtual students. This limitation could be addressed with the surge of generative AI and the inclusion of voice recognition technology. Second, the simulation on a 2D screen lacks the immersive qualities that are necessary for creating a more authentic teaching practice experience. This limitation could be overcome with the use of high-immersion VR.

Due to the outlined limitations of 2D teaching simulations, scholars increasingly make use of high-immersion VR for PSTs' training with various approaches to student-teacher interaction. As of 2024, we identify three main approaches of teaching simulations in VR regarding the way teacher-student interaction is managed. First, students in the virtual classroom can be controlled by an external person, for example, a researcher (Lugrin et al., 2016; VR Team, 2023; Wiepke et al., 2019). Second, other PSTs might play the role of students in VR using virtual avatars (Lee & Wu, 2024). Third, student behavior in VR can be simulated by the software and, to some extent, be AI-generated (see Pitura et al., under review). What all the three approaches have in common is that they offer realistic experiences to PSTs due to the increased sense of presence in VR, and spontaneous verbal and non-verbal interactions between PSTs and virtual students. While the first two approaches require settings in which real people control the student avatars, the third approach is promising due to its scalability and individual usage.

A VR-AI-assisted simulation is defined as "a virtual environment that combines virtual reality and artificial intelligence to create immersive and interactive scenarios allowing PSTs to practice and refine their teaching skills" (Pitura et al., 2024, p. 1). In the study by Pitura et al. (2024), the participants were English language PSTs who practiced teaching content knowledge (the present perfect tense, specifically) in a VR classroom. The verbal interactions between PSTs and virtual students were facilitated using generative AI, with ChatGPT producing questions asked by the simulated classroom students. The nonverbal behavior of the students included gestures and facial expressions. Despite this limitation, this study represents a pioneering transition from static, solely pre-programmed teaching simulations to those that are partially free-flowing thanks to generative AI.

### 3.1. Benefits of VR-AI–assisted simulations for general teacher training

VR-AI–assisted simulations for teacher training provide several benefits. Some of them are pertinent to VR-based simulations such as VR being a safe and controlled practice environment (Kaplan-Rakowski, 2024). Another typical benefit of using VR is that it can provide engaging and motivational scenarios with an elevated sense of presence and embodiment (e.g., Kaplan-Rakowski et al., 2023; Ye & Kaplan-Rakowski, 2024). Such scenarios can be useful for PSTs as they may need to engage in repetitive scenarios to develop their teaching skills. Classrooms in high-immersion VR can be designed realistically, and therefore can elicit authentic behavior from the participants (Slater, 2009), resulting in a higher ecological validity of the simulation (Loomis et al., 1999). This closeness to reality can facilitate transfer of learning into future real-life situations (Makransky & Petersen, 2021).

The incorporation of AI within VR has further benefits, including personalized feedback to PSTs, elicitating adaptative behavior, and raising awareness for teaching competences and weaknesses (Zhang et al., 2024). This adaptive learning approach ensures that PSTs receive the proper level of challenge to encourage their professional growth (King et al., 2022). In contrast to traditional approaches in which feedback is given by a person, typically a teacher educator or an experienced teacher, AI-generated feedback can be accessed by PSTs anytime, anywhere, and is independent from the quality of the personal relationship in the educational setting.

 

Another major benefit of VR-AI-assisted simulations is the facilitation of reflective practice, which is needed to cultivate adaptive teaching. That is, the immersive nature of VR, combined with AI-driven interactions, encourages PSTs to reflect on their teaching practices. For example, questions by AI-driven students in the VR simulation can stimulate PSTs to assess their instructional approach to explain a certain topic and help them consider other approaches, thereby enriching their methodological competences (Pitura et al., 2024). The natural interactions can steer PSTs to focus on their feelings in the teaching role during the simulation. Moreover, PSTs can repeat similar teaching scenarios multiple times and reflect on their professional growth. Such reflective processes are necessary for developing an understanding of pedagogical concepts and improving teaching efficacy (Mann & Walsh, 2017).

### 3.2. Existing challenges of VR-AI–assisted simulations for teacher training

Despite the numerous benefits, challenges associated with integrating VR-AI simulations in teacher training exist. Ertmer (1999) identified logistical and beliefs-based barriers to technology integration. The integration of VR-AI–assisted simulations is affected by logistical barriers. A lack of VR-AI–assisted applications dedicated specifically to PSTs' training is evident. Among further challenges are the relatively high cost of VR equipment, the need for technical support, and some issues that are pertinent to AI technology (speech recognition technology glitches, interaction lag, etc.). Because VR-AI–assisted simulations in the context of PSTs' training are novel, users' beliefs concerning their effectiveness still remain unknown. However, given past research on the integration of other novel technologies (Eickelmann & Vennemann, 2017), mixed beliefs are likely to exist.

### 3.3. VR-AI–assisted applications

As of October 2024, we identified two VR-AI-assisted applications potentially suitable for teaching simulations: *Virtual Speech* and *Ovation*. Both applications are initially designed to train soft skills in public speaking, communication, and presentation using high-immersion VR. These applications aim to help users practice their skills, overcome public speaking anxiety, and improve their language skills in a variety of scenarios, such as in conference rooms, auditoriums, or classrooms (see Figure 1). We focus mainly on the classroom scenario in which PSTs can present a topic to virtual students and use a virtual blackboard to make the scenario more realistic. The key AI-based feature of *VirtualSpeech* and *Ovation* is the verbal interaction with the virtual students. These verbal interactions are based on voice recognition and language generation using ChatGPT as a large language model and include, for example, asking questions about the topic of the lesson that PSTs introduced (as done in Pitura et al., 2024). Therefore, users can communicate with the audience in real-time, making the experience more authentic and free flowing. After interacting in a scenario, both VR applications provide detailed AI-generated feedback on PSTs presentation skills, such as speech pace and volume, use of filler words, or eye contact with the students (see Figure 2).

 

Figure 1. Screenshots of the classroom scenarios in *VirtualSpeech* (left) and *Ovation* (right).

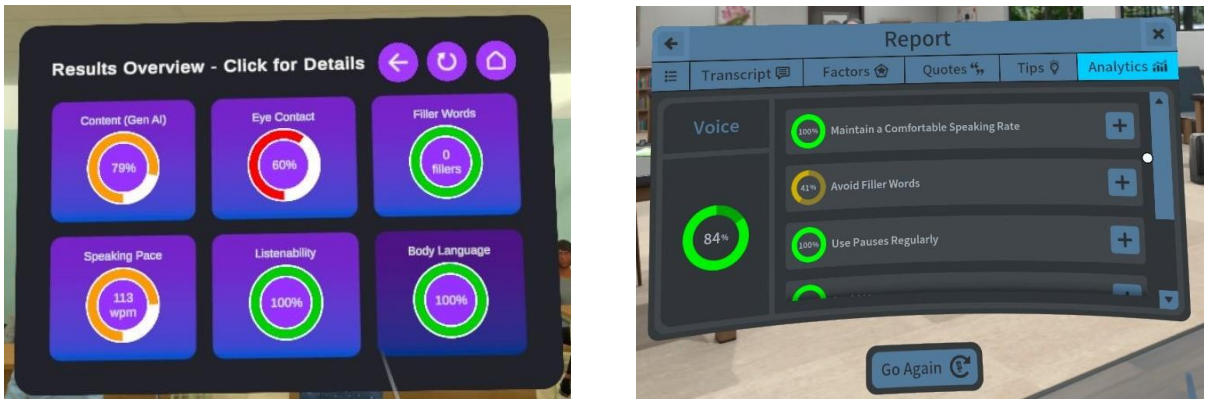


Figure 2. Screenshots of Artificial Intelligence (AI)–generated feedback in *VirtualSpeech* (Left) and *Ovation* (Right).

Although the applications for VR-AI-assisted teaching simulations for foreign language PSTs' training are promising, limitations exist. For the currently available applications, the limitations include the representational fidelity of virtual students and classrooms. For example, there is a mismatch between the spontaneously generated verbal and pre-programmed non-verbal behavior of virtual students and graphic design. Moreover, the current teaching procedures remain limited. In both VR applications, PSTs can present a topic, after which they receive AI-generated questions related to the topic of their presentation, using voice recognition and ChatGPT. Therefore, modern, less teacher-centered teaching approaches with high interactivity between students and teachers are not yet possible in these simulations.

## 4. VR-AI–assisted simulations for foreign language PSTs' training

In the context of FL education, VR simulations can be used to promote PSTs' own language competences, especially as many foreign language teachers are not native speakers of the target language. Given the compelling research on VR as a tool for coping with foreign language anxiety (Gruber & Kaplan-Rakowski, 2020; Kaplan-Rakowski & Gruber, 2023; Thrasher, 2022), VR may be a viable platform for non-native speaker PSTs to practice foreign language teaching without negative consequences (McGarr, 2021). Moreover, VR-AI-assisted simulations can be used to foster foreign language PSTs' pedagogical content knowledge (Shulman, 1986) which is necessary for teaching and explaining elements of the target language to their students (Pitura et al., 2024).

### 4.1. Language competences

Numerous studies have shown that high-immersive VR can be beneficial for developing language competences across multiple areas (e.g., Dhimolea et al., 2022). Regarding VR-AI–assisted simulations for PSTs' FL competences, the potential lies mainly in an opportunity to speak in the FL and therefore develop fluency in the target language. In contrast to general speaking exercises, VR-AI–assisted classroom simulations elicit typical

classroom discourse (e.g., phrases and chunks that teachers use to instruct FL students). The AI-generated spontaneous questions from the students can lead to free-flowing natural conversations that help PSTs practice their competences in a setting that is nearing real-world fidelity. Moreover, AI-generated individual and immediate feedback on language use helps identify and address potential gaps and errors. Hence, VR-AI–assisted classroom simulations bear a special potential to improve pragmatic competences (Kaplan-Rakowski, 2024) such as fluency, coherence, and flexibility, along with linguistic competences including grammar and pronunciation.

### 4.2. Professional knowledge

VR-AI-assisted simulations can be suitable for two areas of FL PSTs professional knowledge (Shulman, 1986). One area is content knowledge, such as their FL competences and knowledge about linguistics (i.e., grammatical structures). Another area is pedagogical content knowledge, which involves knowing how to teach FL, determining whether and how to explain certain aspects of the target language. By offering an ecologically valid scenario with spontaneous AI-generated verbal interactions with the students in VR, PSTs can practice how to teach certain topics and can test various strategies for explaining FL structures. Moreover, the interaction can help PSTs notice gaps in their content knowledge, for example, in case they identify challenges in explaining a certain topic (Pitura et al., 2024). Consequently, PSTs can benefit from VR-AI-assisted simulations to help them recognize areas needing improvement.

### 4.3. Affective-motivational competences

In line with the CAMIL Model (Makransky & Petersen, 2021), mastering a teaching situation in a VR-AI–-assisted simulation can increase self-efficacy, which may benefit FL PSTs. As the simulation allows for self-paced practice, chances are likely that PSTs will experience mastery. That is, they may feel competent about their own teaching in a complex situation, therefore developing higher teacher self-efficacy, which is a highly important predictor of the quality of teaching (Klassen & Tze, 2014). Such mastery experiences are the strongest source of self-efficacy (Bandura, 1986) and can especially benefit from VR-AI–assisted simulations.

Moreover, high-immersion VR can help FL learners cope with public speaking anxiety (Gruber & Kaplan-Rakowski, 2020; Kaplan-Rakowski & Gruber, 2023; Thrasher, 2022), which might be an issue that PSTs struggle with (Pitura et al., 2024). As most PSTs practice speaking in front of a class mainly in the teaching practicum (Becker et al., 2019), VR-AI–assisted simulations can be a useful tool to increase opportunities to practice teaching in a highly realistic setting with spontaneous AI-generated student interactions. This approach may reduce teaching anxiety and boost PSTs' confidence in real-life classrooms.

## 5. Conclusions

Although incorporating AI in VR classroom simulations holds the potential to be a pivotal innovation for initial teacher education, it is unlikely to replace the actual experience of teaching practice. Instead, it can serve as a supplementary tool. VR-AI–assisted applications offer a highly realistic training environment for PSTs because of the spontaneous interaction with virtual students compared with pre-programmed, static communication. As of 2024, some limitations persist in current VR-AI applications for PSTs' training. For example, in Pitura et al. (2024), the verbal interactions between the PSTs and virtual students were assisted by generative AI, while the nonverbal interaction remained static and pre-programmed, therefore obstructing the authenticity of the simulation. Future advancements in VR-AI–based technology are anticipated to enhance both verbal and nonverbal communication of virtual students with PSTs who are using the simulation, thereby providing a more spontaneous and realistic teacher training environment. PSTs will then be able to receive better feedback and more authentic interactions with students in VR-AI classroom simulations, thereby multiplying the potential for transfer of PSTs' competences into real-life teaching situations. Moreover, a central benefit of VR-AI–assisted applications is that they can be used by PSTs independently for practice and reflection in a highly individualized and economic way. While such simulations should not replace real-life teaching practice in PSTs programs, they represent a promising opportunity

 

to integrate more practice into teacher education programs and to help PSTs develop core practices in an adaptive and individualized manner, therefore supporting approximations to real teaching practice.

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# Language corpora and data-driven learning

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# Chinese Easy Corpus: An effective tool for teaching Chinese as a second language

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***Abstract***

*The Chinese Easy Corpus (CEC) is a resource developed to support teaching Chinese as a second language (CSL). CEC simplifies the use of corpus tools to promote the widespread use of corpora and the implementation of data-driven learning (DDL) in CSL classrooms. DDL engages learners with authentic language examples from corpora, enhancing vocabulary acquisition, grammatical mastery, and long-term memory retention. However, when corpora are applied in teaching environments, large general corpora are often criticized for their less intuitive interfaces and for providing sentences that are not well-suited for learners' needs, which can overwhelm both teachers and learners. To address these issues, CEC draws insights from effective corpus tools like SkELL and Learner's Sõnaveeb, creating a more user-friendly and pedagogically appropriate resource. It incorporates Good Dictionary Examples (GDEX), which selects suitable example sentences based on metrics such as sentence length and word difficulty. Additionally, CEC improves Chinese word segmentation, enhancing the reliability and ease of sentence retrieval. With its streamlined interface and refined data retrieval, CEC caters to the specific needs of CSL teachers and learners, reducing technical obstacles and encouraging the use of DDL. Future efforts will focus on refining CEC's functions, user interface, and GDEX algorithms, guided by feedback from practical applications in DDL courses.*

***Keywords:*** *corpus; data-driven learning; Chinese Easy Corpus; GDEX.*

## 1. Introduction

With technological advancements and the widespread availability of computers, language teachers and material developers are increasingly adopting corpus tools in their work. Concurrently, corpus-based or corpus-aided language learning methods have gained significant attention. Numerous studies have investigated the application of data-driven learning (DDL) in second language classrooms (Boulton, 2010; Chambers & O'Sullivan, 2004; Cresswell, 2007). DDL encourages learners to engage with authentic texts through observation and analysis, guided by teachers, ultimately enabling them to discover and generalize language rules (Johns, 1991). Numerous studies have confirmed the efficacy of this method, demonstrating that DDL can effectively enhance vocabulary and grammar learning (Liu & Jiang, 2009), improve lexical awareness (Xue, 2021), and facilitate the acquisition of vocabulary in English for Specific Purposes (ESP) word lists (Smith, 2020). Additionally, DDL has been shown to deepen learners' memory, resulting in better retention rates (Lee et al., 2019). Furthermore, while DDL primarily focuses on students' language input, it also enhances their productive abilities. For example, Japanese learners of

English improved their writing abilities after DDL activities, which guided them to compare their language output with that of native speakers and develop error correction and self-editing skills (Mizumoto & Chujo, 2016). Beyond language skills, DDL activities involve various higher-order cognitive skills, helping learners develop metacognitive knowledge, critical thinking skills, autonomous learning (Aston, 2001; O'Sullivan, 2007; Yoon & Jo, 2014), independent learning ability, and boosting their confidence and language awareness (Yoon, 2008).

Despite the repeated verification of DDL's efficacy, many challenges remain to be addressed. Since corpora play a central role in DDL, the quality of the corpus determines its success. However, corpora often face criticism, and the application of DDL remains limited. Many of these challenges stem from the nature of the corpus itself. Using corpus tools requires a certain level of technological abilities, which can be challenging for some teachers. Additionally, incorporating corpus activities into curricula consumes valuable class time to instruct students on tool usage. Large general corpora often feature advanced analysis tools intended for linguistic researchers, which can render the interfaces complex and unintuitive. Such complexity can lead to resistance and apprehension among beginners. Furthermore, texts from large general corpora often prove problematic when applied to teaching, as they can be too difficult, too lengthy, or irrelevant to learners' needs, making them unsuitable for educational purposes (Boulton & Cobb, 2017; Breyer, 2009; Kilgarriff et al., 2015; Lin, 2019; Poole, 2020).

In addition to the common difficulties, general Chinese corpora present the unique challenge of word segmentation. Unlike English, Chinese text does not have spaces between words, requiring users to manually insert spaces when searching (Chang, 2022); otherwise, the system treats the entire input as a single word, resulting in no results. This manual segmentation requirement is not intuitive, unlike the user-friendly search experience of major search engines like Google or Bing, where phrases or even sentences can be searched directly. Furthermore, non-expert users often struggle to determine the correct word boundaries without specialized knowledge in computational linguistics. This additional complexity can discourage teachers and learners from using corpora after initial attempts.

This paper discusses the 'Chinese Easy Corpus' (CEC) platform, which has been developed specially for Chinese language teaching to address these issues. The CEC aims to facilitate the application of DDL in Chinese language classrooms by providing materials tailored for grammar instruction and suitable example sentences. This paper first outlines the development and features of pedagogical corpus tools designed for foreign language learners, and then details the CEC and its potential applications in CSL classrooms.

## 2. Pedagogical corpus tools designed for foreign language learners

To address the challenges faced by large general corpora in language teaching, researchers have developed specialized corpora tailored for second language learning. These learner-centred corpus tools incorporate features that simplify the user interface and provide pedagogically appropriate content, making them more effective for language learning environments.

### 2.1. SkELL: Sketch Engine for Language Learning

SkELL (Sketch Engine for Language Learning)[1] is a specialized corpus tool developed to support language learners. It simplifies corpus use by providing a user-friendly interface and incorporating the Good Dictionary Examples (GDEX) to present suitable example sentences (Kilgarriff et al., 2015). GDEX evaluates sentences using metrics such as sentence length, word frequency, and sentence completeness, ensuring that the sentences are readable and pedagogically valuable.

The GDEX within SkELL evaluates and selects example sentences based on the following criteria (Kilgarriff et al., 2008):

[1]SkELL: https://skell.sketchengine.eu/

- **Sentence Length:** Sentences should contain between 10 and 25 words.
- **Word Frequencies:** Sentences should primarily consist of high-frequency words, avoiding rare or obscure terms.
- **Contextual Clarity:** Sentences should avoid pronouns or anaphors that rely on external context for understanding.
- **Target Word Position:** Sentences where the target word appears in the main clause or at the end are preferred.
- **Sentence Completeness:** Sentences must start with a capital letter and end with appropriate punctuation.
- **Co-occurrence with Strong Collocates:** Sentences featuring the target word with its frequent collocates are prioritized.

Following this, SkELL supports multiple languages including English, German, Italian, Estonian, Russian, and Czech. For English, it comprises approximately one billion words from varied sources such as news articles, academic papers, Wikipedia, open-source fiction, and web pages. SkELL offers three main functions: Examples, Word Sketch, and Similar Words.

Hirata and Hirata (2019) examined the potential of SkELL in the classroom for Japanese students of English at a lower proficiency level who have almost no online experience in educational settings. Consequently, approximately 81% of students thought SkELL was more effective for their learning than their regular dictionaries due to the larger number of example sentences. And more than 80% of students thought it was effective in enhancing their overall English learning. Troy (2022) implemented SkELL for vocabulary learning in a university, enabling students to discuss the usage and meanings of new words with peers without referring to textbooks or dictionaries. Sixty-one point five percent of the students expressed a desire to continue using SkELL for vocabulary learning. Post-course questionnaires from both studies revealed that students found SkELL to be an effective tool for learning English. The user-friendly interface and GDEX make the examples provided by SkELL suitable not only for advanced proficiency learners but also for those with lower language proficiency, rendering it an effective tool for data-driven learning activities.

### 2.2. Learner's Sõnaveeb

Learner's Sõnaveeb[2] is a corpus resource specifically designed for those learning the Estonian language. It forms part of the Estonian online dictionary, Sõnaveeb, catering to learners at A2 to B1 proficiency levels (Koppel et al., 2019). The corpus comprises 6,000 basic words, offering simplified definitions and example sentences. Similarly to SkELL, Learner's Sõnaveeb employs GDEX to evaluate and present suitable examples.

The GDEX in Learner's Sõnaveeb incorporates both hard and soft classifiers to score sentences on a scale from 0 to 1 (Koppel, 2017; Koppel et al., 2019). Hard classifiers are mandatory criteria, and sentences must meet all these criteria to be considered. Soft classifiers are ideal conditions that enhance a sentence's suitability but are not strictly required. The primary criteria include (Koppel, 2017):

**Hard Classifiers:**

- **Sentence Completeness:** Sentences must be complete and contain between four and 20 words.
- **Sentence Length:** Words within sentences should not exceed 20 characters.
- **Verb Inclusion:** Sentences must include a verb.
- **Illegal Characters:** Sentences should not include prohibited characters such as [<|\@>^].
- **Sentence Start:** The first word should not be an interjection, abbreviation, or transitional phrase.
- **Word Frequency:** All words in the sentence must appear at least five times in the corpus.

[2]Learner's Sõnaveeb: https://sonaveeb.ee/lite

- **No Keyword Repetition:** No repeated keywords within the sentence.

**Soft Classifiers:**

- **Rare Words:** Sentences containing low-frequency words (less than 1,000 occurrences) are penalized.
- **Optimal Sentence Length:** Preferred sentence length is between six and 12 words.
- **Avoidance of Pronouns and Proper Nouns:** Sentences should avoid pronouns, rare punctuation marks, and proper nouns.
- **Limited Adverbs and Pronouns:** Sentences should not have more than one adverb, pronoun, or proper noun, and no more than two verbs.

To understand the results of the GDEX score calculation and compare them with manually compiled dictionary examples, Koppel (2019) compiled a set of 160 sentences. These sentences were evaluated by both lexicographers and learners for their suitability. The set included 40 corpus sentences with high GDEX scores, 40 corpus sentences with low GDEX scores, 40 corpus sentences not filtered by GDEX, and 40 manually compiled dictionary sentences. Ultimately, evaluations were collected from five lexicographers and nine learners.

The results indicated that the best sentences were the manually compiled dictionary examples, with 96% of respondents agreeing on their suitability. Corpus sentences that met the GDEX criteria were deemed appropriate by 85% of respondents. Randomly selected corpus sentences that had not been filtered by GDEX were supported by 60% of respondents, while only 6% of respondents found the corpus sentences that did not meet the GDEX criteria to be suitable. This demonstrates that while GDEX-selected sentences are still inferior to manually compiled examples, they are significantly better than randomly selected corpus sentences, particularly in effectively filtering out poor-quality sentences.

Further inquiry into why respondents considered certain sentences unsuitable revealed that the most common issues included the presence of pronouns whose antecedents were not within the sentence, requiring additional context for comprehension. Some sentences were deemed too colloquial, and others were either too long or too short. This underscores that the development of GDEX calculations requires not only initial developer efforts but also continuous user feedback and evaluation to achieve optimal performance.

## 3. Chinese Easy Corpus (CEC)

The Brown Corpus was the earliest large-scale corpus (one million words) established in the mid-1960s (Kučera, Francis, & Carroll, 1969). In Taiwan, the Academia Sinica began collecting linguistic data in the 1990s, completing the first edition of the Chinese corpus with two million words in 1995. Currently, the version 4.0 called "Academia Sinica Balanced Corpus (ASBC)" is available online, which contains around 10 million words[3]. However, the interface of ASBC is an early design which is not very user-friendly and struggles with handling complex queries. Nevertheless, these deficiencies have been addressed through the development of the query system of the Corpus of Contemporary Taiwanese Mandarin (COCT) by Taiwan's National Academy for Educational Research (NAER). In CSL classrooms, COCT and Sketch Engine (SkE) are recommended by language teachers; the former is for its extensive corpus data and various functions, the latter is for its simplicity and data visualization function (Chang, 2022; Chang & Tseng, 2023; Smith, 2011; Wang et al., 2020). Despite the increasing user-friendliness of corpus tools, complaints persist that the materials from corpora are too difficult for learners and that teachers must invest considerable time in preparation. The Chinese Easy Corpus (CEC)[4] was developed to address these two obstacles in the application of data-driven learning.

[3] Academia Sinica Balanced Corpus: https://asbc.iis.sinica.edu.tw/

[4]Chinese Easy Corpus: http://grammarpoints.ddns.net/index.php

### 3.1. Features of CEC

CEC employs CKIP (Chinese Knowledge and Information Processing) Transformers for text processing[5], which helps in segmenting the text accurately and assigning part-of-speech tags. To ensure suitability for pedagogical purposes, each sentence is evaluated using GDEX. CEC offers a range of features designed to make corpora use more accessible and effective for CSL teachers and learners:

- **User-Friendly Interface:** The interface is designed to be intuitive and easy to navigate, reducing the technical barriers often associated with using corpora.
- **Enhanced Search Capabilities:** Users can perform both basic and advanced searches, including queries using regular expressions and part-of-speech tagging.
- **Flexible Search Options:** CEC stores both segmented and original sentences, allowing users to input search queries without needing to manually segment Chinese characters.
- **Pedagogically Appropriate Content:** The corpus uses GDEX to rank sentences, ensuring that the most suitable examples for grammar instruction, vocabulary acquisition, and other language learning objectives appear at the top of the search results.
- **Integration of Authentic Texts:** CEC includes a wide range of authentic texts from various sources, providing learners with exposure to real-world language use.

### 3.2. Design of GDEX score algorithms

The GDEX in CEC is meticulously designed to select example sentences that are both readable and pedagogically appropriate. The parameters used include:

**(1) Sentence Completeness:** This criterion accounts for 35% of the overall GDEX score and ensures that the sentence provides a basic readable structure. A sentence is considered complete when:

- The first token is not a punctuation mark (except for opening quotation marks).
- The sentence ends with a period, exclamation mark, question mark, or closing quotation mark.
- The sentence contains at least one verb.

Sentences that meet these conditions receive a raw score of 1 point, weighted to contribute up to 35 points to the overall GDEX score.

**(2) Sentence Length:** This criterion contributes 15% to the overall GDEX score and is based on the number of words in a sentence after segmentation, excluding punctuation marks. The scoring is as follows:

- Sentences with 10 to 28 words receive a raw score of 1 point.
- Sentences with five or fewer words, or 50 or more words, receive a raw score of 0 points.
- Sentences with six to nine words or 29 to 49 words receive a proportionally calculated raw score between 0 and 1. For example, the sentence '*Xuézhě rènwéi xiàyǔ búhuì yǐnfā dìzhèn'* (Scholars believe that rain does not trigger earthquakes) is segmented into '*xuézhě* (scholar) / *rènwéi* (believe) / *xiàyǔ* (rain) / *búhuì* (won't) / *yǐnfā* (trigger) / *dìzhèn* (earthquake)' with a total of six words. Based on the proportion within the range of five to 10 words, it receives a raw score of 0.2 points.

This raw score is then weighted, contributing up to 15 points to the overall GDEX score.

**(3) Lexical Difficulty**: This criterion accounts for 30% of the overall GDEX score and assesses the difficulty of the words used in a sentence. CEC uses the word list from *Taiwan Benchmarks for the Chinese Language* (Lin et al., 2020) as the basis for lexical difficulty. The calculation formula for lexical difficulty is:

[5]CKIP-transformers: https://github.com/ckiplab/ckip-transformers

$$\text{Lexical Difficulty Raw Score} = \left(\frac{\sum(\text{Level 1, 2, 3 Words}) \times 1 + \text{Level 3}^{*}\text{ Words} \times 0.9 + \ldots + \text{Level 7 Words} \times 0.1}{Number\ of\ Words}\right) - \left(\frac{Number\ of\ Long\ Words}{Number\ of\ Words} \times 0.15\right)$$

Words are scored based on their difficulty level, with penalties for long words (four or more characters). This raw score is then weighted, contributing up to 30 points to the overall GDEX score.

**(4) Word Frequency:** This criterion contributes 20% to the overall GDEX score, reflecting how often words appear in the sentence. In general, words with higher frequency are considered easier for learners to understand than those with lower frequency. CEC uses the word frequency information from the sub-corpus of COCT – 2019 Written Chinese Corpus. The average word frequency is calculated by:

$$\text{Average Word Frequency} = \frac{\sum(\text{Word Frequencies})}{Number\ of\ Words}$$

Punctuation marks, repeated words, and the particle *de* (的) are excluded from this calculation. The raw score for word frequency is then converted to a percentile rank and weighted, contributing up to 20 points to the overall GDEX score.

By applying these criteria, CEC ensures that the sentences presented are suitable for learners, making the corpus more effective for teaching purposes.

### 3.3. Sub-corpora of CEC

CEC comprises two primary sub-corpora: one for broad usage, hereafter referred to as the General system, and the other one tailored for corpus-based teaching on advanced Chinese grammar points (expressions), hereafter referred to as the Grammar system. Presently, the total corpus encompasses approximately 11 million words, with plans for ongoing updates and expansions. The General system primarily draws its data from the ASBC. The Grammar system currently collects 208 grammar points from popular teaching materials in Taiwan[6], each providing 30 to 50 sentences for data-driven learning. These sentences are sourced from the COCT and have been manually selected and edited by experts. Therefore, there are over 9,000 manually curated and edited sentences in the system.

#### *3.3.1 The General System*

The General system[7] addresses the limitations of large general Chinese corpora by allowing users to search for words, phrases, and even sentences across the entire corpus without needing to manually insert spaces or segment the text. This corpus is designed for general use, providing a broad range of example sentences suitable for various teaching and learning contexts. Additionally, for advanced users, the search system supports wildcards and regular expressions, enabling more complex searches. For example, users can use symbols in their queries to find certain patterns: using '.' to match one character or one word. The query syntax '*suīrán* .{3,5} *dànshì'* can find all sentences using '*suīrán* (although)' and '*dànshì* (but)' with three to five words between them. The query syntax '*yī*.*yī*.' can find all sentences using four-character fixed expressions with '*yī* A *yī* B' patterns, such as '*yìxīn-yíyì* (wholehearted)' and '*yìmó-yíyàng* (exactly alike).' Figure 1 shows the search results for the query '*suīrán* .{3,5} *dànshì*' using the General system. The sentences are displayed with their corresponding GDEX scores, which determine the order of the sentences from highest to lowest. This sorting ensures that the most pedagogically appropriate sentences are presented first.

[6] The grammar points are mainly from the third, fourth and fifth volume of *A Course in Contemporary*

[7] *Chinese*. The General system: http://grammarpoints.ddns.net/general.php

**General Query (一般查詢)**

You are looking for sentences that contain '雖然 .{3,5} 但是'

34 sentences are found

Download

back to front new query

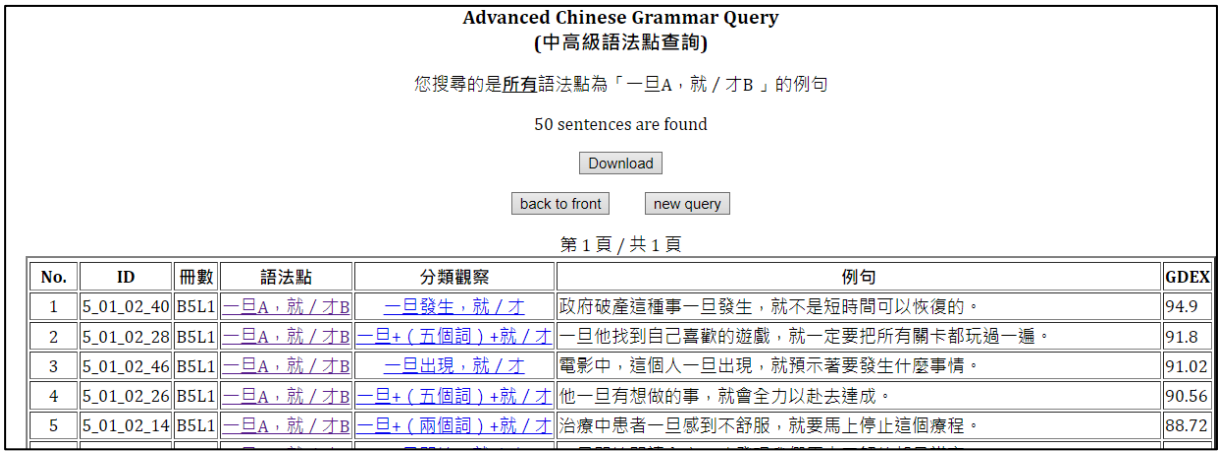
| No. | Example | GDEX |
|---|---|---|
| 1 | 總統府為求公平雖然沒能照辦，但是特別回信鼓勵這一位令老師感動的小朋友，為他加油。 | 88.50 |
| 2 | 滑板車的速度雖然沒有直排輪快，但是一不小心，還是會發生意外。 | 84.00 |
| 3 | 雖然天公不作美，但是大家的熱情未減，興致仍是高昂，努力的去表演，過了快樂的一天。 | 82.65 |
| 4 | 另外，特教課表示，許多所學校雖然努力辦學，但是方向常常有偏差。 | 72.93 |
| 5 | 雖然已經是秋天，但是腸病毒疫情並未退燒。 | 72.00 |

Figure 1. Search results using regular expression for *suīrán* and *dànshì* with three to five intermediary words.

### *3.3.2 The Grammar System*

The Grammar system[8] provides more than 200 advanced grammar points, allowing users to search for typical usages. This corpus is mainly designed for pedagogical use, especially for teachers' preparation of instructional materials. The creation of corpora materials is pivotal for the success of paper-based DDL, as they serve as the fundamental source for learners to observe, analyze, deduce, or induce patterns. Prior to compiling these materials, they usually engage in tasks such as reviewing previous research findings or accessing learner corpora to understand learners' difficulties, which serve as focal points for preparing instructional materials (Chang & Tseng, 2023). For language teachers, it is a time-consuming and labour-intensive task. In this system, corpora materials are generally presented in three ways to guide students' observation: firstly, based on typical collocational relationships; secondly, organized by different structures; and thirdly, arranged according to sentence length variations.

Taking the grammar '*yídàn* A *jiù*/*cái* B (once...then)' for example, Figure 2 shows that 50 sentences are found. Users can further observe the examples by subcategories (the 5th column from the left in the below table).



**Advanced Chinese Grammar Query**
**(中高級語法點查詢)**

您搜尋的是所有語法點為「一旦A，就 / 才B 」的例句

50 sentences are found

Download

back to front new query

第 1 頁 / 共 1 頁

| No. | ID | 冊數 | 語法點 | 分類觀察 | 例句 | GDEX |
|---|---|---|---|---|---|---|
| 1 | 5_01_02_40 | B5L1 | 一旦A，就 / 才B | 一旦發生，就 / 才 | 政府破產這種事一旦發生，就不是短時間可以恢復的。 | 94.9 |
| 2 | 5_01_02_28 | B5L1 | 一旦A，就 / 才B | 一旦+（五個詞）+就 / 才 | 一旦他找到自己喜歡的遊戲，就一定要把所有關卡都玩過一遍。 | 91.8 |
| 3 | 5_01_02_46 | B5L1 | 一旦A，就 / 才B | 一旦出現，就 / 才 | 電影中，這個人一旦出現，就預示著要發生什麼事情。 | 91.02 |
| 4 | 5_01_02_26 | B5L1 | 一旦A，就 / 才B | 一旦+（五個詞）+就 / 才 | 他一旦有想做的事，就會全力以赴去達成。 | 90.56 |
| 5 | 5_01_02_14 | B5L1 | 一旦A，就 / 才B | 一旦+（兩個詞）+就 / 才 | 治療中患者一旦感到不舒服，就要馬上停止這個療程。 | 88.72 |

Figure 2. Search results for the grammar point '*yídàn*…*jiù*/*cái* (once…then)'.

There are subcategories like '*yídàn fāshēng, jiù*/*cái* (once something happens, then)' (sentence ID: 5_01_02_40), and '*yídàn chūxiàn, jiù*/*cái* (once something appears, then).' (sentence ID: 5_01_02_46). This categorization helps

[8]The Grammar system: http://grammarpoints.ddns.net/grammarpoints.php

users observe the high-frequency collocations. The other sentences in the table are categorized according to sentence length. When users click on a subcategory, more sentences under that subcategory are displayed for their observation. Similarly to the General system, the sentences are sorted using GDEX scores to ensure that the most suitable examples are presented first. The system also features a download option to help teachers efficiently create paper-based learning materials.

## 4. Concluding remarks

Corpora have long been established as mature and convenient tools for linguists. However, their application in language teaching has been limited due to the uncontrollable nature of authentic language data, the operational complexity of corpora, and the significant time investment required by instructors. To address these issues, this study has developed the CEC. The key features of CEC are as follows:

User-Friendly Interface: CEC offers a streamlined interface and simplified search methods, reducing the time needed to learn how to operate the corpus and alleviating users' apprehension towards corpora.

Optimized Sentence Retrieval: Inspired by GDEX, CEC uses quantifiable metrics such as sentence length, word frequency, and vocabulary difficulty to score and rank sentences. This ensures that sentences are presented in a useful order for instructional purposes, filtering out those that are too complex, lengthy, or incomplete, thereby saving teachers' time in material selection and enabling learners to study language independently through the corpus.

Grammar Query System: CEC includes over 9,000 sentences for 208 grammar points that have been meticulously curated and corrected by experts, providing ready-to-use teaching materials and saving instructors the time required for DDL lesson planning.

Furthermore, CEC is an evolving resource, and future developments will focus on refining the GDEX algorithms to enhance the quality of example sentences, expanding corpus content to cover a wider range of topics and language levels, and improving the user interface to make CEC even more intuitive and user-friendly. With its innovative features and ongoing development, CEC has the potential to be a valuable tool for both teachers and learners, contributing to the effectiveness of language education and broadening the accessibility of corpus-based learning methods. Ultimately, the goal is to facilitate the observation and analysis of authentic language data via corpora, fostering autonomous learning.

In this era of big data and rapidly evolving technology, the avenues for foreign language learning extend far beyond the traditional classroom. Learners can utilize a variety of media to study target languages. This study anticipates that a well-designed corpus can provide unprecedented assistance to learners of all proficiency levels in enhancing their language abilities.

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# Enhancing gender-neutral language awareness in Japanese English learners: A data-driven learning approach

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***Abstract***

*This study examines the effectiveness of a data-driven learning (DDL) approach in enhancing the understanding and use of gender-neutral language among Japanese university students learning English. Twelve undergraduate economics majors who are intermediate English learners participated in this study. The study focused on 12 English terms traditionally characterized by gender-specific usage but increasingly replaced with gender-neutral alternatives. Using the LECS Online corpus, the participants engaged in hands-on, investigative tasks, analyzing and comparing gender-specific and gender-neutral terms. Pre- and post-tests were conducted to assess the effectiveness of the DDL approach. The results revealed a significant reduction in gender-specific expressions and incorrect word choices, and an increase in the use of gender-neutral terms. These findings highlight the importance of active engagement and practical application in language learning. Reflective writing indicated that, while students recognized the shift toward a gender-neutral language, ingrained stereotypes and traditional language habits continued to influence their perceptions. This suggests that linguistic changes alone may be insufficient to alter deep-seated gender biases; a comprehensive educational approach that includes historical and social context is necessary. Incorporating DDL strategies into language curricula can foster a deeper understanding of contemporary language use and its social implications, promoting gender inclusivity and linguistic equity.*

***Keywords:*** *Data-Driven Learning (DDL); gender; corpus.*

## 1. Introduction

Language plays a crucial role in shaping and reflecting societal norms including gender roles and biases. In recent years, awareness and efforts to shift from gender-specific to gender-neutral language to promote inclusivity and equality have increased. Gender-specific terms such as “chairman,” “fireman,” and “policeman” are increasingly being replaced with gender-neutral alternatives such as “chairperson,” “firefighter,” and “police officer.” This shift aims to reduce the reinforcement of traditional gender roles and promote a more inclusive use of language that does not assume or prioritize one gender over another.

The transition to a gender-neutral language is particularly relevant for language learners, for whom the nuances of gender-specific versus gender-neutral terms may not be immediately apparent. For example, in Japanese, the shift from gender-specific to gender-neutral language is not as prominent as it is in English, which makes it challenging for learners to adopt these changes.

 

This study explores how a data-driven learning (DDL) approach can aid Japanese university students studying English as a foreign language in understanding and using gender-neutral language more effectively. DDL involves using language corpora to provide learners with real-world examples and data-driven insights into language use. By engaging in hands-on investigative tasks using a comprehensive language corpus, students acquire a deeper understanding of authentic language use and its social implications. Recent studies have revealed that DDL is highly effective in language teaching, particularly in developing learners' analytical skills and enhancing their awareness of linguistic nuances (Boulton & Cobb, 2017; Chambers, 2019; Chen & Flowerdew, 2018). This study explores the impact of a DDL approach on Japanese university students' understanding and use of gender-neutral English terms.

## 2. Literature

In recent years, the transition from gender-specific to gender-neutral language has become a focal point in linguistic research and social policy. This shift is driven by the recognition that language not only reflects but also shapes societal norms, including gender roles and biases (Jones et al., 2020; Pauwels, 2003). The use of gender-neutral terms such as "chairperson" instead of "chairman" or "firefighter" instead of "fireman" aims to promote inclusivity and equality by avoiding the reinforcement of traditional gender roles (Lassonde & O'Brien, 2013).

DDL has emerged as an effective approach to language teaching that provides learners with real-world examples and insights into language use through language corpora. DDL allows learners to engage in hands-on investigative tasks, fostering a deeper understanding and critical thinking about language and its social implications (Boulton & Cobb, 2017). The effectiveness of DDL in enhancing linguistic skills and awareness has been well-documented. For instance, Chambers (2019) identified that DDL significantly improves learners' analytical skills and their ability to understand linguistic nuances. Similarly, Chen and Flowerdew (2018) reported that DDL helps learners grasp the contextual use of a language, thereby enhancing their overall language proficiency. Satake (2020) discovered that DDL helps learners correct errors accurately (particularly article and preposition omission errors) in their L2 essays.

Incorporating DDL strategies into language teaching can be particularly beneficial in addressing gender biases used by language learners. DDL promotes a more reflective and inclusive approach to language learning by exposing learners to authentic language data and encouraging them to draw conclusions. This method aligns with the principles of critical pedagogy, which advocate the use of education as a tool for social change (Freire, 1970).

The use of language corpora in DDL provides a rich resource for exploring the frequency and context of gender-specific and gender-neutral terms. Studies have revealed that corpus-based analyses can reveal significant disparities in the use of these terms, highlighting the need for greater awareness and education regarding inclusive language practices (Baker, 2010). By examining real-world examples, learners can better understand the impact of their linguistic choices and the importance of language use to promote equality and inclusivity.

In summary, the extant literature underscores the importance of transitioning to a gender-neutral language to promote inclusivity and equality. Although this transition presents challenges, particularly for language learners, the use of DDL approaches in language teaching offers a possible solution. By engaging learners in the analysis of authentic language data, DDL not only enhances their linguistic skills, but also raises awareness of the social implications of language use. Therefore, this study aims to explore the impact of DDL on Japanese university students' understanding and use of gender-neutral language.

 

## 3. Method

### 3.1. Participants

The study included 12 undergraduate Japanese economics majors from a private university in Tokyo, who participated in a 15-week elective English course with 90-minute weekly classes during the fall semester of 2023. According to the Common European Framework of Reference for Languages (CEFR), the participants' English proficiency was, on average, at the B1 to B2 level.

### 3.2. Instruments

#### *3.2.1. Task*

This study focused on the analysis of 12 English terms traditionally characterized by gender-specific usage but now increasingly replaced with gender-neutral alternatives. These terms include "chairman" (now "chairperson"), "doorman" ("door attendant"), "fireman" ("firefighter"), "freshman" ("first-year student"), "mankind" ("humankind"), "man-made" ("artificial"), "policeman" ("police officer"), "postman/mailman" ("post worker/mail carrier"), "salesman" ("salesperson/sales representative"), "spokesman" ("spokesperson"), "steward/stewardess" ("flight attendant"), and "waiter/waitress" ("server"). The participants were administered a worksheet (see Appendix) and tasked with investigating three sets of gendered and gender-neutral expressions for 15 minutes each week for four weeks using the Wordbanks Online corpus. Their assignment involved searching for and comparing examples, analyzing the usage of these terms, applying the findings to composing English sentences using gender-neutral terms, and write reflective pieces about their findings. This process was designed to foster a hands-on investigative approach to learning, enabling participants to draw conclusions regarding language use and its societal implications.

#### *3.2.2. Corpus*

The LECS Online corpus was used, which is a domain-specific corpus comprising 2.1 billion words collected from the Web in the fields of economics, politics and international relations, law, and Information and Communication Technology (ICT). The participants used the LECS Online corpus through the user-friendly interface of the Shogakukan Corpus Network (SCN). Using the SCN interface to access the LECS Online corpus, users can also search for the included sub-corpora, such as the British National Corpus (BNC: a 100-million-word corpus of contemporary British English) and the PERC Corpus (a 17-million-word corpus of science and technology). As the participants had never used a corpus, they were provided instructions for 20 minutes regarding using the corpus to search for and compare examples, and examine term usage.

#### *3.2.3. Tests*

The effectiveness of this DDL approach was assessed through pre- and post-tests in which the participants were instructed to write English expressions corresponding to the Japanese translations of the 12 focus terms. Except for the term "doorman," the Japanese translations did not include any gender-specific expressions. Therefore, it is reasonable to state that the Japanese expressions for the other terms are unlikely to have led to the production of gender-specific equivalents in English. Both tests had the same questions, and the participants were provided five minutes to complete them. The participants were awarded one point per item response, and Wilcoxon signed-rank tests were conducted on the pre- and post-test results for all word gender categories.

### 3.3. Procedure

The following procedure was adopted:

1. The participants attempted the pre-test (5 minutes in class, Week 1).

2. Before the first task, instructions regarding the use of the Wordbanks Online corpus were provided (20 minutes, Week 1).

 

3. The participants engaged in the task of analyzing three sets of gender-specific words and gender-neutral alternatives by consulting the corpus (15 minutes, Weeks 1-4).

4. The participants attempted the post-test (5 minutes in class, Week 4).

5. The author analyzed the results.

## 4. Results

Of the 12 participants, seven attempted both the pre- and post-tests; therefore, the analysis was based on data from these seven participants. Table 1 presents the average number of words categorized by type for the pre- and post-tests. The pre-test averages were gender-specific words at 2.6, gender-neutral words at 3.7, and incorrect word choices at 5.7. The post-test averages were gender-specific words at 2.0, gender-neutral words at 7.3, and incorrect word choices at 2.7. This indicates a decrease in gender-specific expressions and incorrect word choices, and an increase in gender-neutral expressions in the post-test (see Figure 1). The results suggest that the participants infrequently used gender-specific expressions before the corpus-searching task, while they were unfamiliar with gender-neutral expressions and often used incorrect words; however, using the corpus-searching task, the participants strengthened their understanding of gender-neutral expressions, remembered them, and began to use them accurately.

**Table 1**. Average number of words by word type for the pre- and post-tests.

| | Gender-specific | Gender-neutral | Incorrect word choices |
|---|---|---|---|
| Pre-test | 2.6 | 3.7 | 5.7 |
| Post-test | 2.0 | 7.3 | 2.7 |

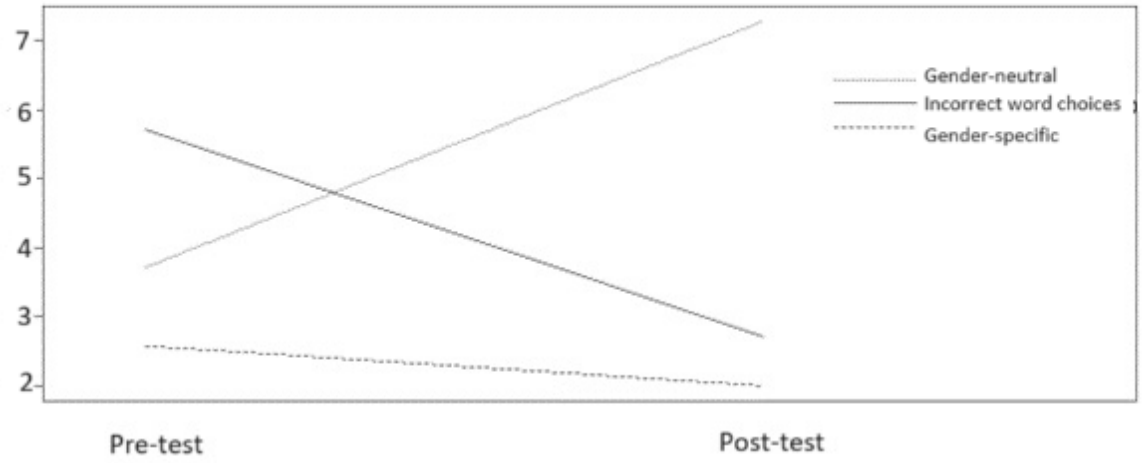


Figure 1. Average number of words by word type for the pre- and post-tests.

Wilcoxon signed-rank tests were conducted on the pre- and post-test results for gender-specific, gender-neutral, and incorrect word choices. Significant differences with large effect sizes were found between the pre- and post-tests for all word gender categories (Gender-specific: $z = 2$, $p = .046$, $r = .54$; Gender-neutral: $z = 2.43$, $p = .015$, $r = .65$; Incorrect word choices: $z = 2.65$, $p = .008$, $r = .71$). Therefore, it can be concluded that in the post-test,

 

gender-specific expressions and wrong word choices significantly decreased, whereas gender-neutral expressions significantly increased.

The reflective writing revealed that participants developed a deeper understanding of gender issues in language. They noted that although gender-neutral terms are being adopted, their own biases and perceptions of certain roles remained gendered, highlighting the persistence of ingrained stereotypes despite linguistic changes (see 5. Discussion).

## 5. Discussion

The pre- and post-test results revealed a noticeable shift in the participants' choice of vocabulary. The pre-test averages indicated a high frequency of incorrect word choices. However, the post-test results revealed a marked improvement, with participants adopting more gender-neutral terms and reducing their error rates. This shift can be attributed to the hands-on and investigative nature of DDL tasks, which engaged participants in the active learning and critical analysis of language use. Wilcoxon signed-rank tests further validated these findings, highlighting significant effects with large effect sizes for both the word gender category factor and interaction effect. This aligns with previous studies indicating that active engagement and practical application are critical for language acquisition and behavioral change (Ellis, 2008).

Moreover, the participants' reflective writings in the worksheets revealed an enhanced understanding and awareness of gender issues in language. The participants' corpus-based investigation revealed several noteworthy insights into the usage of gender-specific and gender-neutral terms, as well as the perception of gender roles. The analysis highlights how linguistic choices can reflect and perpetuate societal gender norms and stereotypes, despite efforts being made to adopt a more inclusive language.

The participants recognized that the corpus data revealed disparities in the frequency of usage between gender-specific and gender-neutral terms. For example, words like "firefighter" and "police officer," though used, were less frequent than their gendered counterparts, "fireman" and "policeman." Similarly, terms like "salesperson" were gender-neutral and intuitively understandable, yet were not as commonly used. They also noted that terms such as "freshman" and "mankind" were used more frequently than their gender-neutral alternatives, reflecting resistance to change possibly due to familiarity and tradition. The participants considered that, while gender-neutral terms are being adopted, they have not yet fully replaced gender-specific terms in everyday language. This indicates a potential gap between the availability of these terms and their regular adoption in discourse. The participants emphasized the need for greater awareness of the historical and social contexts behind such changes to facilitate a more comprehensive shift in language use.

Though the participants found that the shift from gender-specific to gender-neutral terms, such as "chairman" to "chairperson" and "fireman" to "firefighter," was evident in the corpus data, they also noted that despite the adoption of these terms, perceptions of certain roles remained gendered. For example, one participant mentioned still imagining men when reading the word "chairperson," highlighting the persistence of ingrained stereotypes. The participants reflected on the broader implications of these linguistic changes, recognizing that simply changing words may be insufficient to alter deep-seated gender biases. The low frequency of "door attendant" compared with "doorman" further illustrates how linguistic habits and the gendered nature of certain professions may continue to reinforce these biases.

Furthermore, the participants questioned the necessity of differentiating between genders in occupational titles, as seen with "steward" and "stewardess." The preference for gender-neutral terms such as "flight attendant" suggests a move toward inclusivity, while the traditional terms remain prevalent.

Overall, the participants expressed insights into how language can reflect and influence social norms and values, particularly concerning gender inclusivity. They stated that societal perceptions and linguistic habits must evolve concurrently, and that the adoption of gender-neutral terms is a positive step. Analyzing gender-specific words and gender-neutral alternatives by consulting the corpus and incorporating corpus-based activities and DDL

 

strategies into language curricula can foster a deeper understanding of contemporary language use and its social implications. By exposing learners to authentic language data and encouraging them to draw conclusions, critical thinking and an awareness of language evolution can be promoted. This is particularly pertinent when addressing gender biases in language. Involving students in active research and exploration through corpus consultation is an effective approach to language teaching, particularly in areas such as gender sensitivity. Although the sample size was small, the findings provide valuable insights, though further studies with larger participant groups would help to confirm and expand upon these results.

## 6. Conclusion

This study demonstrated the significant impact of a DDL approach in enhancing the understanding and use of gender-neutral languages among Japanese university students. By engaging in hands-on investigative tasks using the corpus, participants were able to explore and compare gender-specific and gender-neutral terms, leading to notable improvements in their language use. The results showed a significant decrease in gender-specific expressions and incorrect word choices, along with an increase in the use of gender-neutral terms.

These findings highlight the importance of active engagement and its practical benefits in language learning. The DDL approach not only enhanced participants' linguistic skills but also increased their awareness of the social implications of language use. Reflective writings indicated that, while students recognized the move towards gender-neutral language, ingrained stereotypes and traditional language habits continued to influence their perceptions. This suggests that linguistic changes alone may be insufficient to alter deep-seated gender biases; a comprehensive educational approach that includes historical and social contexts is necessary.

In conclusion, incorporating corpus-based activities and DDL strategies into language curricula can promote a deeper understanding of contemporary language use and its social implications. Teachers should promote a more inclusive and reflective approach to language learning by exposing learners to authentic language data and encouraging critical thinking. Overall, this study contributes to the ongoing discourse on language and gender by advocating for educational practices that support gender inclusivity and linguistic equity. Future studies should explore the long-term effects of DDL interventions and their applicability in different contexts and proficiency levels.

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# Appendix

## Example of worksheets

Worksheet

| 1 | chairperson/chair |
|---|---|
| (1) Referenced sentence | ・The chairperson is also designated by the president. |
| (2) Composition | ・The council member shall elect a chairperson every year. |
| (3) Findings | ・I didn't feel any strange to read these sentences. But I still imagine men when I read this word "chairperson" because I haven't seen the female chairperson of such a big council on TV. |
| 2 | door attendant |
| (1) Referenced sentence | ・Act as a door attendant to regulate the entry of customers or other persons |
| (2) Composition | ・The duty of door attendant is essential for high-ranking people's party. |
| (3) Findings | ・There are just two sentences with using this word in Word Blanks Online. On the other hand, there are 24 sentences with using "door man". I thought this difference expressed how little "door attendance" is used in our daily life. |
| 3 | firefighter |
| (1) Referenced sentence | ・Medford Mon Hardball 6 Yaphank honors the name of heroic firefighter Mon still have s. |
| (2) Composition | ・I have heard the experiences that retired firefighter talked to us and his experiences made me surprised. |
| (3) Findings | ・There are 320 sentences using "fire fighter" on the website.(and 1725 sentences using "fire man") The number of sentences using "fire fighter" is less than that using "fire man" but I think that number is enough to say that this word is using ordinary. |

FINDINGS

・Changing words may be an effective opportunity to notice that we had stereotype about these words. But I think what change the words is not enough to change our idea. To change our idea, I think we should have interest in why these words were changed and how that changes effect.

 

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# When old is better than new: Contextualizing corpus-based readability in Romanian language textbooks for targeted digital intervention

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***Abstract***

*School textbooks in Romania have seen significant changes over the past three decades. During communist times, there was a single textbook for each discipline per grade, which remained largely unchanged. After 1989, these were replaced by "alternative-model" textbooks, offering more than one option per discipline and grade. However, despite approval from the Ministry of Education, this diversity has not kept pace with digital advancements and educational research. In this paper, we use corpus-based case studies to analyse text readability and overall text-related complexity in primary school textbooks for Romanian Language and Communication. Our corpus consists of two sub-corpora: (1) ROLAT-1-4-OLD, representing the old Romanian textbooks used until 1989, and (2) ROLAT-1-4-NEW, comprising modern textbooks for primary schools. Using an experimental readability formula for Romanian texts (Oraviţan et al., 2023), incorporated into the LEMI readability platform (Chitez et al., 2024), we assessed the linguistic complexity of selected datasets. Our results indicate that NEW textbooks exhibit higher linguistic complexity compared to OLD textbooks, which is also higher than the grade and age levels. We interpret these findings within the broader context of textbook design, noting that OLD textbooks appear better designed on several parameters: structure, content (i.e. interplay between text, tasks, and visual elements), type and number of assignments, as well as the linguistic characteristics of both texts and assignments. We conclude by highlighting the correlation between textbook readability, overall design, and cognitive load (Sweller, 1994), which affects the students' learning motivation and effectiveness. We suggest employing the LEMI readability tool to test and improve didactic materials.*

***Keywords:*** *textbook readability; Romanian textbook assessement; linguistic analysis of Romanian textbooks; corpus-based textbook analysis; LEMI readability platform.*

## 1. Introduction

Textbooks have been considered, for a long time, as essential didactic support instruments in most educational systems (UNESCO, 2005). The implementation of textbook policies in each country correlates with its students' academic success. On the one hand, there are national policies which emphasise the use of teaching materials that reflect the content required by the national curricula for each school level and profile. This is the case, for

example, of countries such as Japan where "all primary school textbooks are required to follow the Japanese Course of Study and to adhere to Japan's textbook inspection system" (Sumida, 2017, p. 152). Japanese students consistently achieve top international rankings - for instance, in the PISA assessments (OECD, 2019) - partly because their education system emphasizes discipline and employs standardized national textbooks that align with and reinforce this disciplined cultural approach (Stevenson & Stigler, 1992). There are also countries which have reduced reliance on traditional textbooks in favour of more diverse, flexible, and engaging teaching resources which promote critical thinking, creativitiy and problem solving competences for their students. This is the case of some of the countries with the best results in international tests such as PISA: Finland (Sahlberg, 2021), Singapore (Liu, 2024) or Estonia (Tire, 2021). The educational models with the largest private educational pool, such as Montessory, Waldorf, Reggio Emilia or International Baccalaureaate have also adopted textbook-independent teaching approaches. In other cases, such as the United States with the Common Core State Standards (Brown & Kappes, 2012) or Switzerland with the *Lehrplan 21*[1], the national systems moved away from teaching-by-textbook towards competence based teaching where teachers create their own teaching materials in order to achieve students' learning objectives. Textbooks are also created and used but they are optional and integrative (i.e. connection between disciplinary topics, thus enhancing critical thinking, is emphasized).

In Romania, or similar countries who have undergone massive transition periods from a centralist system such as the one in communist times towards a democratic multiple-alternative system, the integration of textbooks in school education is still a visibly improvable process. As in many other situations when the "transition" meant the adoption of an international model without fundamentally changing elements such as didactic instruction or institutional organisation, the elimination of the Romanian unique textbook, which was the cornerstone of the communist school education, and the integration of alternative textbooks was and continues to be deficitary at multiple levels. First, there is a continuous miscorrelation between the academic success of the students, at the national and international assessments, and the self-proclaimed creation of textbooks that are not curriculum-centered but competence-based (Fartușnic, 2018). In fact, the opposite is valid: even if there are multiple textbooks and their reliance on the same national curriculum is guaranteed, one can notice the great content dispersion rates from a basic common learning ground (Žnidarec Čučković et al., 2023, pp. 34-35; Hobjilă, 2021). This means that, for example, if a list of competences or topics should be covered, for a specific grade, as indicated in the national curriculum, each textbook interpretes these requirements extensively. In most cases, an over-complexity of the initial list of competences and topics is achieved (Nagy & Kovács, 2022), which is counterproductive for learners. Successful learning models such as the Singaporean model "Teach Less, Learn More" (TLLM) (Liu, 2024, p. 31) have demonstrated the power of simplification in teaching and recommend a decrease in complexity of topics per grade so that students have time to understand basic concepts before moving to more advanced ones.

Linguistic complexity of textbooks is one component which supports content complexity. In other words, if concepts are not explained in simple language or if the vocabulary the students are exposed to in (language) classes is too complex, the teaching process is affected and the learning outcome will suffer. In this paper, we will demonstrate how the modern Romanian textbooks are deficient in respect to linguistic complexity which, in turn, reflects content complexity. The dataset consists of primary school Romanian language and communication textbooks. We will compare this with a set of old Romanian textbooks, the last ones used before the fall of the Communism in 1989. This is performed not to demonstrate that the content of the old textbooks was better, since the textbooks were abundant in propagandistic materials, but to demonstrate that the type of texts selected for reading and analyses, the complexity of the texts used (i.e. readability) and the task-related linguistic complexity were considerably more age adapted and appropriate than in modern textbooks. We also propose a digital instrument, the LEMI platform (Chitez et al., 2024) to assess the readability of the teaching materials for primary school so that the linguistic complexity bias should be minimized and educational content can be more effectively tailored to students' comprehension levels.

[1] *Swiss Curriculum 21*, retrieved June 17, 2024 from https://www.lehrplan.ch/.

## 2. Method

Creating textbook linguistic corpora has been a double-edged challenge: in the first place, the access to the old Romanian textbooks is limited. There are digital archives but they are incomplete. The solution was to purchase old textbooks from antiquarian bookstores and to digitize them. This resulted in the creation of the corpus ROLAT-1-4-OLD (i.e. Corpus of Romanian Language Textbooks, grades 1 to 4, old versions before 1989). As for the modern textbook dataset, we had free digital access to all textbooks but they were numerous and time-consuminng to process. This second dataset is ROLAT-1-4-NEW (i.e. Corpus of Romanian Language Textbooks, grades 1 to 4, new versions, in use in 2024). The analysis of Romanian textbooks from a linguistic point of view has not been performed until now, nonetheless a corpus-based analysis. Previous textbook analyses (e.g. Szakács, 2007), for example, approach history topics in pre- and post-communist times and the construction of national identity through them.

Several linguistic case-studies (see section 3.1.) have been conducted based on the data available and the employed automatic assessment tools. For instance, there have been cases in which digital textbooks could be downloaded but the PDF had the scanned-image format which means that no word conversion could be performed. In this case, sample word count procedures were performed. In other cases, the conversion of sample images into simple text (.txt) required the use of Romanian-specific OCR[2] tools. Manual data cleaning was perfomed, especially in the case of NEW textbooks which are loaded with images and text boxes which are displaced after OCR-isation.

### 2.1. Textbook corpora

As mentioned, the two corpora are not balanced in point of size, considering that only one discipline-specific textbook was in use per grade in the OLD textbook dataset. For the grades 3 and 4, the discipline of *Romanian Language* has been split into two sub-competence textbooks: *Reading Comprehension* and *Grammar and Communication*. They are both used for the same grade and discipline and are considered as one textbook set. In the NEW textbook corpus, six to elven discipline-specific alternatives were used per grade (see Table 1 with details on each corpus content and Appendix for complete textbook references).

**Table 1**. Content of ROLAT-1-4-OLD and ROLAT-1-4-NEW

| **Dataset** |
|---|
| ROLAT-1-4-OLD (6 textbooks) |
| 1st Grade: *Abecedar;* 2nd Grade: *Limba română. Manual pentru clasa a II-a* ; 3rd Grade: *Citire. Manual pentru clasa a III-a*; 3rd Grade: *Gramatică și compunere. Manual pentru clasa a III-a* ; 4th Grade: *Citire. Manual pentru clasa a IV-a* ; 4th Grade: *Gramatică și compunere. Manual pentru clasa a IV-a* |
| ROLAT-1-4-NEW (19 textbooks) |
| 1st Grade: *Comunicare în limba română. Manual pentru clasa I*, Editura Didactică și Pedagogică; 1st Grade: *Comunicare în limba română. Manual pentru clasa I*, Art Klett; 2nd Grade: *Comunicare în limba română. Manual pentru clasa a II-a*, Didactică și Pedagogică; 2nd Grade: *Comunicare în limba română. Manual pentru clasa a II-a*, Art Klett; 3rd Grade: *Limba și literatura română. Manual pentru clasa a III-a*, Corint; 3rd Grade: *Limba și literatura română, clasa a III-a: manual*, Intuitext; 3rd Grade: *Limba și literatura română: clasa a III-a*, Didactică și Pedagogică; 3rd Grade: *Limba și literatura română. Manual pentru clasa a III-a*, Litera; 3rd Grade: *Limba și literatura română. Manual pentru clasa a III-a*, CD Press; 3rd Grade: *Limba și literatura română. Manual pentru clasa a III-a*, Paralela 45; 3rd Grade: *Limba şi* |

[2] Optical character recognition (OCR) is a process by which text from scanned documents, images, or PDFs is converted into machine-readable text that can be edited and searched.

*literatura română: clasa a III-a*, Art Klett; 3rd Grade: *Limba și literatura română: manual pentru clasa a III-a*, Aramis; 3rd Grade: *Limba și literatura română: clasa a III-a*, CD Press; 4th grade: *Limba și literatura română. Manual pentru clasa a IV-a*, Art Klett; 4th grade: *Limba şi literatura română: clasa a IV-a*, Didactică și Pedagogică; 4th grade: *Limba și literatura română, clasa a IV-a*: *manual*, Intuitext; 4th grade: *Limba și literatura română. Manual pentru clasa a IV-a*, CD Press; 4th grade: *Limba şi literatura română: clasa a IV-a*, Art Klett; 4th grade: *Limba și literatura română: manual pentru clasa a IV-a*, Paralela 45.

### 2.2. Linguistic complexity assessment

There have been several parameters on which we assessed the linguistic complexity of textbooks. In the first place, good indicators were word density (total number of words per number of pages), mid-textbook and end-textbook linguistic complexity sample analyses[3] as well as the readability assessment for selected samples. As for the readability assessment, we used the newly improved readability formula for LEMI (Chitez et al., 2024). The formula used in this study includes the following variables: Average Sentence Length (ASL), Percentage of Complex Words (PCW), Unique Complex Words Density (UCWD), Words Density (WD), Monosyllabic Words and Bisyllabic Words. The readability formula is of L2 type meaning that the result of the formula "indicates the level of necessary education to understand the text" (Chitez et al., 2024, p. 16451), i.e. the grade recommended for using the text.

Beyond linguistic complexity, an overall textbook content assessment, which is derived from and supports the linguistic complexity assessment, includes information on page content coverage such as: images, types of tasks, types of activities, types of information. This was also performed according to sampling principles (i.e. same criteria for selection of samples from different textbooks such as location in the textbook, or didactic purpose).

## 3. Results

### 3.1. Linguistic case studies

*#Case study No. 1: 1st grade textbook (for pupils aged 7-8)*

The basic parameters of the 1st grade textbooks in the OLD and NEW datasets are: the OLD textbook (Abecedar 1982) has 135 pages and approximately 6,000 words. The NEW textbook used for this analysis (ArtKlett 2023) has 136 pages and approximately 20,000 words. The word density per page (wpp: word per page) is considerably higher in the NEW textbook (147.05 wpp) compared to the OLD one (44.4 wpp). Table 2 captures several textbook content features that are both linguistically and didactically relevant: first page with letters (Paris, 2005), use of monosyllabic words (Adams, 1994), presence of hand-writing samples (Graham & Harris, 2005), mid-textbook linguistic complexity (Chall, 1983), page content coverage (Unsworth, 2001), or readability (DuBay, 2004).

**Table 2**. Description of linguistic and content features in OLD textbook versus NEW textbook sample (1st grade)

| **Assessed features** | **OLD (Abecedar 1982)** | **NEW (ArtKlett)** |
|---|---|---|
| *First page with letters* | Page 23 | Page 8 (from the beginning) |
| *Pages with predominantly monosyllabic words* | Pages 23-50 | None |
| *Presence of hand-writing samples* | Pages 23-118 | Pages 20-135 |
| *Mid-textbook linguistic complexity sample* | Page 67 ("Haiducul"):<br>15 x 1 syllable words; 8 x 2 syllable words; 4 x 3 syllable words; 2 x 4 syllable words; | Page 72 ("Daruri"): 17 x 1 syllable words; 8 x 2 syllable words; 2 x 3 syllable words; 3 x 4 syllable words; 1 x 5 syllable word; |

[3] To ensure comparability between textbook samples, mid-texbook and final-textbook samples were extracted. Mid-textbook means a text or a unit situated in the middle of the textbook (calculated as the mid-point of the total number of teaching units in the textbook). The end-textbook sample means a text or a teaching unit at the end of the textbook.

| | | |
|---|---|---|
| *Readability score** | ➢ **1.535** (adapted for 1st graders) | ➢ **1.112** (adapted for 1st graders) |
| *Page content coverage* | ➢ 1 image; 10 word syllable samples; 1 text (10 sentences); 1 fill in exercise; 1 handwriting sample | ➢ 6 images; 10 word syllable samples; 2 texts (8 / 6 sentences); 1 pronounciation exercise; 1 analysis; 1 game; 1 handwriting sample; 6 text instructions |
| *End-textbook linguistic complexity sample* | Page 123 ("Spune adevarul"):<br>25 x 1 syllable words;<br>22 x 2 syllable words;<br>13 x 3 syllable words;<br>4 x 4 syllable words; | Page 134 ("Cine e câștigătorul?"):<br>37 x 1 syllable words;<br>49 x 2 syllable words;<br>35 x 3 syllable words;<br>13 x 4 syllable words; |
| *Readability score** | ➢ **1.73** (adapted for 1st graders; advanced) | ➢ **1.70** (adapted for 1st graders; advanced) |
| *Page content coverage* | ➢ 1 image; 1 text (14 sentences) | ➢ 5 images; 1 text (10 sentences); 2 exercises (multiple-choice; matching); 1 oral exercise |

*only reading text (not instructions)

The readability formula used to assess the linguistic complexity of texts is an adaptation of the formula developed for the automatic linguistic assessment of texts for the LEMI tool for children's literature texts, accessible at www.lemi.ro (see details in section 2.2). Table 3 illustrates the pages and text used for the analysis of the mid-textbook readability score and page content coverage included in Table 2.

**Table 3**. Sample of mid-textbook content in OLD versus NEW


Source: 1st grade textbook OLD (Abecedar 1983, p. 67)


Source: 1st grade textbook NEW (ArtKlett 2023, p. 72)

The analysis was extended (Table 4) from one new textbook (ArtKlett in Table 2) to three other new 1st grade textbooks:

**Table 4**. Overall complexity features 1st grade textbooks (NEW)

| **Textbook** | **Total No Words** | **Total No Pages** | **WPP** (i.e. words per page; average word density) | **Readability sample mid-textbook** (only reading text) | **Readability sample mid-textbook** (including instructions) |
|---|---|---|---|---|---|
| Ars Libri | 20400 | 136 | 150 wpp | 1.613 | **3.58** |
| Paralela 45 | 18000 | 140 | 128 wpp | 1.438 | **2.15** |
| Litera | 25747 | 148 | 173 wpp | 2.407 | **3.94** |

*#Case study No. 2: 2nd grade textbook tasks (for pupils aged 8-9)*

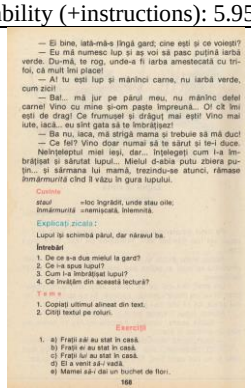
For the second grade, we performed the analysis of end-textbook samples (i.e. a lesson at the end of each textbook). We noticed that each NEW textbook employed these strategies: 1 long text followed by a range of various tasks such as Comprehension and Recall, Argumentation, Analysis and Interpretation, Writing and Creativity, Language Skill exercises or Phonological and Orthographic Skills. Overall, the tendency towards

content and task overload is also present in this case (double in NEW). Regarding the types of tasks, it can be noticed that:

- The OLD textbook has more open (not text related) argumentation and interpretation tasks, promoting critical thinking (in line with Facione, 1990), than the NEW textbooks.
- There is a tendendy towards types of items that have given answers (fill in, multiple choice exercises) in NEW textbooks.
- There is an emphasis on formal elements and literary theory in NEW textbooks (e.g. count paragraphs, demonstrate the typology of a text).
- NEW textbooks emphasize phonologic skills (e.g. identify vowels, consonants, groups of sounds).
- OLD textbooks emphasize grammar and practical grammatical exercises whereas the NEW textbooks require knowledge of theory on punctuation marks.

As for text readability, we can note that, while the OLD textbook had a readability score slightly above the grade range, the overall unit readability (i.e. the linguistic level of the reading texts plus the linguistic level of various assignments) was more cohesive than in the case of NEW textbooks. All textbooks, OLD and NEW, use texts that seem too complex and not grade adapted.

**Table 5**. Text related features in 2nd grade textbooks (OLD versus NEW)

| OLD | NEW (Artklett) | NEW (EDU) |
|---|---|---|
| Readability: 4.496<br>Readability (+instructions): 5.951 | Readability (text): 3.051<br>Readability (+instructions): 6.633 | Readability (text): 3.138<br>Readability (+instructions): 5.858I |
|  |  |  |
| • Vocabulary: 1 item (2 words)<br>• Argumentation: 1 task<br>• Analysis and Interpretation: 4 questions<br>• Homework: 2 tasks<br>• Grammar: 3 grammar exercises<br>**Total: 11 tasks** | • Comprehension and Recall: 6 tasks<br>• Analysis and Interpretation: 4 tasks<br>• Vocabulary and Language Skills: 7 tasks<br>• Writing and Creativity: 3 tasks<br>• Phonological and Orthographic Skills: 2 tasks<br>**Total: 22 tasks** | • Comprehension and Recall: 9 tasks<br>• Analysis and Interpretation: 3 tasks<br>• Vocabulary and Grammar: 13 tasks<br>• Writing and Creativity: 3 tasks<br>• Phonological and Orthographic Skills: 3 tasks<br>**Total: 28 tasks** |

*#Case study No. 3: Linguistic features of tasks in the 4th grade textbook (for pupils aged 10-11)*

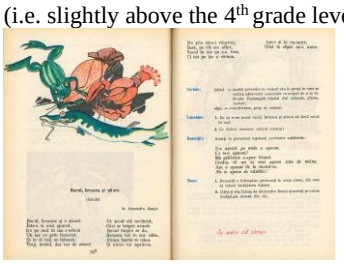
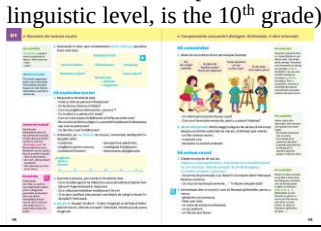
For the 3rd and 4th grade, the OLD Romanian Language and Communication textbooks have been divided into two separate textbooks: *Citire* (Reading Comprehension) and *Gramatică și Compunere* (Grammar and Composition). By separating reading tasks from writing and grammar activities, textbooks provide students with access to structured content, which serves as an effective instructional strategy (Snow, 2002). For the NEW textbooks, this is not the case and the content overload initially noticed in the previous grades is even more pronounced (due to additional grammar topics), potentially leading to increased cognitive strain for students (Sweller, 1994). The OLD-NEW contrastive analysis of tasks indicates that:

- The OLD textbook uses a limited range of task categories (Vocabulary, Exercises, Questions, Homework) which are repeated throughout the textbook and offer predictable practice to students. The NEW textbook

(i.e. ArtKlett), on the other hand, has a set of core task categories, consistently more numerous than the OLD textbook, that is repeated (Vocabulary, Recall, Text Understanding, Text Exploration, Portfolio, Writing) but also multiple other types of tasks that revolve around the core tasks (e.g. Double-Entry Journal, Role Play). The tasks are in line with modern didactic recommendations but the sheer number of them, combined with poor organization, can hinders effective learning (Kirschner, 2002).

- The OLD textbook has clearly defined tasks for Reading Comprehension and Grammar (even different textbooks) which makes it easier for students to focus on one single task and gain a clear understanding of the material (Snow, 2002). The NEW textbook, e.g. ArtKlett, combines reading, writing, and grammar topics in a unsystematized manner, lacking the necessary examples, and explanations to guide students effectively. This non-structured approach makes it difficult for students to follow and comprehend the material, leading to confusion and diminished learning motivation (Castro-Alonso et al., 2021).
- The readability of the NEW textbook (i.e. ArtKlett) is consistantly higher than the educational and cognitive (i.e. age) grade-specific level, especially when it comes to the linguistic features of tasks. Our sample analysis for the 4th grade indicates a readability level specific for the 10th grade level.

**Table 6**. Linguistic analysis of textbook tasks (OLD versus NEW)

| OLD | | |
|---|---|---|
| **Task categories and sub-categories** | **Examples** | **Linguistic complexity of tasks (readability)** |
| *Reading Comprehension*:<br>✓Categories: 33 prose texts and 14 poetry texts<br>✓Sub-categories: Vocabulary (x20) \| Questions (x22) \| Exercises (x16) \| Proverb (x4) \| Homework (x20)<br>*Grammar and Composition:*<br>✓Categories: Parts of a sentence (x15 Units) \| Parts of speech (x17 Units) \| Composition (x10 Units) | ✓How do you explain the title of the story? (p. 24)<br>✓Which is the legend of […]? What other legends do you know? (p. 33).<br>✓Why is the poem called "Spring concert"? (p. 72)<br>✓Recognise the linking words from the following texts (p. 58 Grammar)<br>✓Make the logic scheme of the sentences below (p. 65 Grammar) | **5.03**<br>(i.e. slightly above the 4th grade level)<br>  |
| NEW (ArtKlett) | | |
| *Language and Communication*:<br>✓Categories: 34 prose texts and 3 poetry texts<br>✓Sub-categories (sample Unit 1): Text Comprehension (x8) \| Text Exploration x14) \| Communication (x5); Writing Correctly (x9) \| Remembering Communication Components and Punctuation (x3) | ✓Read the text silently, then aloud [...]<br>✓Portfolio: Highlight, on a sheet, with the help of a graphic organizer/through a diagram, similarities and differences between one of the events you read about in the volume "The Big Recess" and your own school experienc. (p.8) | **10.80**<br>(i.e. considerably above the 4th grade level, since the recommended grade, where students should be able to process such tasks at the linguistic level, is the 10th grade)<br>  |

## 3.2. Use of LEMI

### *3.2.1. Validating LEMI readability formula in the classroom*

The LEMI tool, which has been created at the CODHUS[4] research centre of the West University of Timisoara, Romania, was launched in November 2023. It it a digital platform with two main functionalities: (1) a digital repository of children's literature texts (250 texts) distributed in reading complexity levels, for primary school children, and (2) an automatic analysis interface where uploaded texts (short texts up to 3 pages) can be assessed in point of readability. An initial readability formula for Romanian language texts has been created (Chitez et al.

[4] https://codhus.projects.uvt.ro/

2024) and used for LEMI. This initial formula (which is currently improved and updated) has been classroom-validated through a student survey implemented in autumn 2023 (Oravitan et al., 2023).

The survey results demonstrated that the LEMI tool effectively matches the readability and complexity levels of children's literature attributed to each age group. In the classroom administration, 256 pupils (3rd and 4th graders, including 187 urban and 69 rural students) were asked to rate the complexity of four randomly selected texts using a scale: 1 (easy), 1.5 (fairly easy), 2 (so-and-so), 2.5 (fairly challenging), and 3 (challenging). In total, out of the 256 third and fourth graders who participated, a substantial 96.48% found the texts recommended by LEMI to be suitable for their age (ibid.). This high favorability indicates that the texts included in the LEMI repository are well-chosen for the target audience, confirming the tool's efficacy in guiding young readers to appropriate literature.

#### *3.2.2. Use of LEMI to support textbook improvement and activities*

Using the LEMI tool to improve NEW textbooks involves several strategic steps to ensure that the reading materials and associated tasks match the students' comprehension levels and educational needs. Here are several strategies to use LEMI to support NEW textbook development and use:

- ✓ *Assessment and calibration of text complexity*: LEMI can be used to assess the readability and linguistic complexity of existing textbook content. By analyzing texts using LEMI's readability formula, educators and publishers can identify texts that are either too complex or too simple for the intended grade level. This assessment will help in calibrating the difficulty of texts.
- ✓ *Optimizing task instructions*: One of the main issues with NEW textbooks is the high complexity of task instructions. LEMI can analyze the readability of these instructions and provide insights into simplifying the language used. Simplified instructions will make tasks more accessible to students, thereby improving their engagement and comprehension. This involves breaking down complex sentences, reducing discipline-specific jargon (i.e. complex terminology), and using age-appropriate vocabulary.
- ✓ *Creating age-appropriate content*: LEMI's repository includes texts that have been validated for their appropriateness for specific age groups. Incorporating these texts into NEW textbooks can ensure that the reading material is suitable for the students' cognitive and linguistic levels. This can include replacing overly complex texts with ones that have been pre-assessed and validated by LEMI.
- ✓ *Promoting engagement through diversification*: LEMI can help diversify the types of texts included in textbooks by providing a balanced mix of Romanian classics, modern texts, and foreign literature. This diversity can enhance students' engagement by exposing them to a variety of writing styles and cultural perspectives while ensuring that all texts are within an appropriate readability range.

## 4. Discussion

*Textbook linguistic complexity*: The contrastive analyses of OLD versus NEW primary school textbooks for Romanian language and communication reveals several striking and, at the same time, problematic features. As a general chracteristic, the overall text complexity, which also includes the activity instructions or tasks, is above the age level, as revealead by our readability formula (Chitez et al., 2024). This might be attributed to the increase in word density in NEW versus OLD textbooks revealed by our calculation of wpp, i.e. words per page. For example, if the OLD 1st grade textbook *Abecedar* had 44 wpp coefficient, the modern 1st grade textbook wpp ranges from 120 to 180 wpp, which means an increase of 173% to 309% wpp compared to the OLD textbook.

*Task analysis (categories and linguistic complexity*): There are two main results which refer to the nature and the linguistic profile of the tasks in the primary school textbooks in contrast (OLD versus NEW). On the one hand, the NEW textbooks consistently employ task-overload strategies, which means that the number, typology and density of tasks per page are extremely high (see Table 5). This is also confirmed by the linguistic analysis of tasks which indicates a considerably higher readability index for instructions (i.e. tasks) in NEW versus OLD

textbooks as well as above-grade index. Even if the reading texts in NEW textbooks might be grade-adapted, the linguistic complexity of cumulated texts plus tasks is higher (see Table 4). This means that, even if the text is well selected (i.e. age-adapted), the instructions accompanying it make the overall activity more difficult for students to understand and complete.

*Overall feature complexity of textbooks*: What was evident and confirmed by our analyses, is the exponential growth of content density in NEW versus OLD textbooks. The subjective impression of visual overload of textbook pages with images, explanatory text boxes, exercises within exercises and various other content types, which is disturbing at the cognitive level (Behnke, 2018, p. 388), is confirmed by our sampling procedures (see Table 2).

*LEMI integration and use*: The LEMI tool can support textbook development, particularly for Romanian children's literature. Unlike general readability tools such as Flesch-Kincaid (Flesch, 1948; Kincaid et al., 1975) or Lexile (Stenner et al., 2006), LEMI uses a readability formula specifically tailored for the Romanian language, ensuring culturally and linguistically appropriate assessments. This specificity allows LEMI to precisely calibrate text difficulty, simplify task instructions for better comprehension.Its repository of validated texts guarantees age-appropriate and engaging materials for young readers.

## 5. Conclusions

This corpus-based case study analysis (i.e. only specific datasets from the corpora ROLAT-1-4-OLD and ROLAT-1-4-NEW were used for analysis) of OLD versus NEW textbooks reveals several relevant insights that highlight the better general design and content of the OLD textbooks in terms of linguistic complexity and readability. The OLD textbooks, as exemplified in these case-studies, provided a structured and focused approach to reading comprehension and grammar. This is in line with didactic research recommending the separation of reading and comprehension from grammar and composition (Pressley, 2006). The predictability of the task types (Vocabulary, Exercises, Questions, Homework) in the OLD textbooks provides consistent practice, helping students build their skills methodically and achieve a sense of accomplishment. The structured approach in OLD textbooks contrasts with the NEW textbooks, which combine various grammar topics in an unstructurer manner, lacking necessary samples, examples, and explanations. As previous studies emphasize (Sweller, 1994), an overly intricate textbook structure can make it difficult for students to follow and comprehend the material, which can lead to confusion and diminished learning outcomes.

Furthermore, the readability analysis of both reading texts and corresponding tasks demonstrates that the OLD textbooks display a cumulative text-plus-task readability index which is better balanced than in the NEW textbooks (i.e. the difference in readability between plain text and instruction is lower in OLD than in NEW textbooks). The NEW textbooks in general,display a higher content density and task overload, with more tasks per page and higher linguistic complexity in instructions. This content overload can potentially lead to impairing the students' engagement and both text and task comprehension. The emphasis on formal aspects (e.g. literary theory elements), multiple-choice exercises and phonological skills in the NEW textbooks can also add to cognitive strain (Kirschner, 2002) making the tasks more challenging than beneficial.

In our study of OLD versus NEW textbooks of Romanian Language and Communication, focusing on the analysis of the linguistic complexity of texts, overall text-related task analysis and overall textbook content revealed that OLD textbooks were actually better aligned with research recommendation in linguistics-supported textbook design. At the same time, we demonstrated how the LEMI digital tool can be used for textbook assessment and improvement. Further studies should be conducted based on the expanded textbook corpora ROLAT-OLD and ROLAT-NEW, which should reveal the statistical differences between the OLD and NEW textbooks in a more comprehensive manner. A broader range of linguistic metrics, such as syntactic complexity, vocabulary diversity, and cohesion, alongside a deeper examination of language-related cognitive demands, can verify, for each grade and discipline, whether Romanian textbooks align with contemporary pedagogical principles.

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## Appendix

Complete textbook references for textbooks included in the corpora:

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**NEW:**


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# Language management systems in CALL

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# Fostering equity, accessibility and academic integrity within an LMS module

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***Abstract***

*A mandatory learning management system (LMS) module informing students studying English as a second language (ESL) about academic integrity and university guidelines was implemented at a program level and was a success for several years. However, following a shift to online learning using both synchronous and asynchronous formats, there was an increase of reported cases of academic infractions. The LMS module previously incorporated principles of Universal Design for Learning (UDL) to target the diverse needs of language learners. The current paper reports on an analysis of the module's compliance to research recommendations related to UDL guidelines for improving student comprehension of academic integrity and the application of Web Content Accessibility Guidelines (WCAG) within the LMS module are explored. Furthermore, the introduction and ubiquitous as well as unregulated use of AI has added another concern, as the limited resources and insufficient guidelines about this type of academic infraction present a new challenge for both teachers and students. The presentation includes the impact of previous modifications and discusses potential outcomes in light of the current analysis. The results of the most recent modifications are forthcoming.*

***Keywords:*** *academic integrity; UDL; WCAG; accessibility.*

## 1. Introduction

When teachers enter a university English as a second language (ESL) classroom, it may be rare to find a completely homogenous group of students. From the outset, individual students are not equal in their knowledge, how many languages they speak, how long they have studied the English language, how at ease and how confident they are learning languages and how motivated they are to learn English. It is therefore unrealistic to expect that such a heterogeneous group would all have the same experience regarding academic integrity. And yet, many teachers expect that students should have a solid understanding of academic integrity before beginning university (Cadieux, 2024).

Students who are accused of academic infractions, including the overrepresentation of international students who are frequently not studying in their first language, often report that they didn't understand or think they were committing an infraction (Bertram Gallant, 2015; Ehrich et al., 2016; Pecorari, 2016). Considering this, the role of the language teacher (or any teacher sensitive to this challenge) includes ensuring that academic integrity materials are comprehensible and accessible for all students. This paper shares the process and results of developing an academic integrity module integrated into all ESL courses within a course learning management

 

system (LMS). The impact of the move to online learning combined with the introduction of ChatGPT is also explored, followed by changes that were introduced to better reflect Universal Design for Learning (UDL) guidelines (CAST, 2018), and then the current state of the project, which revisits key UDL points, specifically the area of comprehension, and analyzes the module's compliance with Web Content Accessibility Guidelines (WCAG) (World Wide Web Consortium, 2023). The purpose of this paper is to share reflections about this process and resulting modifications and to encourage teachers to consider this information when developing materials related to academic integrity.

### 1.1. Literature review

#### *1.1.1. Academic integrity*

The European Network for Academic Integrity (ENAI) (Tauginienė et al., 2018, p. 8) defines academic integrity as "a compliance with ethical and professional principles, standards, practices and consistent system of values, that serves as guidance for making decisions and taking actions in education, research and scholarship." Generally, a proactive approach to academic integrity ensuring students understand university policies and guidelines is favoured over a punitive approach that focuses on fear of sanctions (Bertram Gallant et al., 2015; Davis, 2024).

With the aim of reinforcing academic integrity and preventing academic infractions among ESL learners, Dewart & Rosales (2018) developed an obligatory asynchronous learning module within the Moodle LMS allowing all English program course instructors to integrate uniform instruction into their own online course content at the outset of a semester. Module instruction focused on informing students about 1) citing sources correctly and paraphrasing information to avoid plagiarism and self-plagiarism, 2) recognizing the limitations of using external sources for help in a language class (including technological and peer assistance) and 3) understanding university regulations. Following the implementation of the academic integrity module, it was observed that the number of reported cases of academic infractions was reduced to zero (Dewart & Rosales, 2018).

The results from the initial implementation of the learning module were impressive. Reported infractions remained at zero for the following three academic years. However, in 2020, following the shift to online learning during the COVID-19 pandemic, the number of cases began to increase, and this trend has continued and has been further complicated by the introduction of the generative AI (GenAI) ChatGPT. A limited number of UDL guidelines (due to funding) were applied in response to increasing post-pandemic rates with limited impact (Rosales & Dewart, 2022).

#### *1.1.2. Artificial Intelligence*

Artificial Intelligence (AI) is used frequently in language teaching and language learning, such as the use of grammar correction software or using GenAI like ChatGPT to provide writing topics or identify pertinent research articles. However, because these technologies can do many of the tasks requested of students, such as produce an essay on a given topic or summarize a text, the use of AI has brought new challenges for teachers evaluating student progress in a language class. If these technologies are not authorized or acknowledged, it is an academic infraction which may lead to serious consequences.

To inform students about the limitations of the use of AI in the classroom, the ENAI published guidelines for the ethical use of artificial intelligence (Foltynek et al., 2023).The guidelines state that GenAI should not be listed as an author or co-author, yet they strongly suggest acknowledging the use of GenAI, including an indication of how it was used for an assignment along with the prompt input (when possible). The guidelines also emphasize the importance of recognizing the limitations and biases of GenAI. Sharing these guidelines with students is one step toward a more equitable policy that includes AI.

 

### *1.1.3 Equity and accessibility*

In the Global Education Monitoring (GEM) Report, UNESCO (2020) defines equity as "a process or actions aimed at ensuring equality **(**all members of a group enjoy the same inputs, outputs or outcomes in terms of status, rights and responsibilities)". In order to refine the design of the learning module for equity, it is essential to understand which students are considered to be most at risk of accusations of academic infractions. Researchers have identified factors that make some students more vulnerable than others (Bertram Gallant et al., 2015; Ehrich et al., 2016; Davis, 2024), and of particular interest is students having international status, as they are often studying in another language. If materials explaining academic integrity are not adapted for the needs of international students or students studying in an additional language, these students are at a disadvantage regarding academic integrity policies because it is inaccessible. By making resources comprehensible and accessible, both linguistically and digitally, all students can succeed.

### *1.1.4. Universal Design for Learning* (UDL)

UDL offers suggestions to ensure that learning is meaningful, engaging and equally accessible for all students. It presents guidelines that address how students **access**, **build**, and **internalize** information in an academic context to optimize student ***engagement***, vary ***representation***, and diversify ***action and expression*** (Figure 1). In the LMS module, student engagement is addressed by clearly stating the goals of the activity and by providing resources for students to develop their skills and learning strategies. Representations of the information provided in the LMS module are provided in both text and audio formats, and French language resources are linked for additional support. To diversify action and expression, scheduling for in-person support is available.

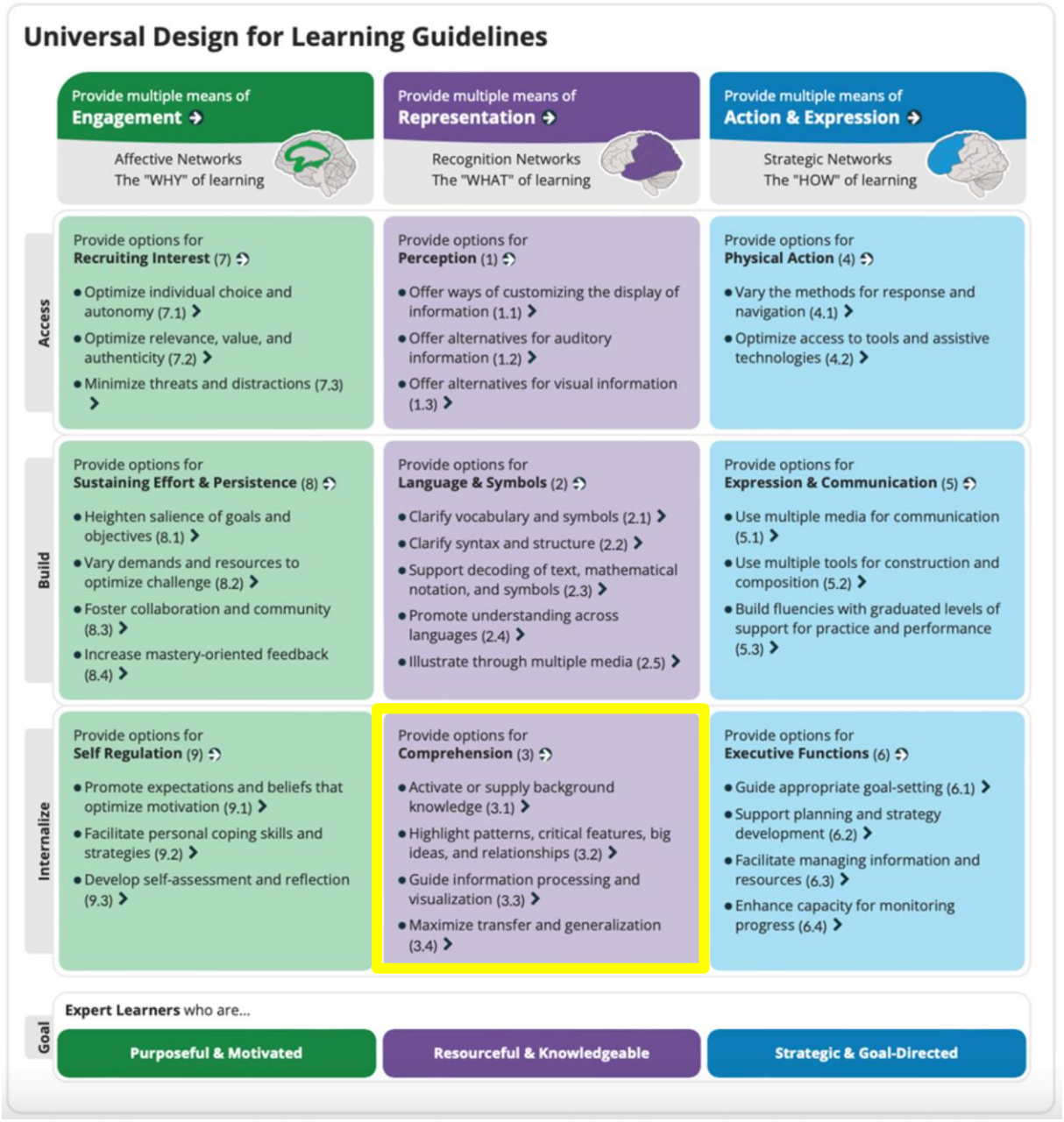


Figure 1. Universal Design for Learning Guidelines. CAST (2018). https://udlguidelines.cast.org.

Davis (2023, 2024) demonstrated a model for applying UDL guidelines for comprehension to improve clarity of academic integrity information for students. Addressing the four checkpoints of comprehension in the UDL model (under Representation and Internalize), Davis advises how following these suggestions can create more inclusive content and resources. The UDL guidelines state in Checkpoint 3.1 that "barriers and inequities exist when some learners lack the background knowledge that is critical to assimilating or using new information" (CAST, 2018). It is therefore essential to either prime this awareness or provide access to this information. Consequently, the first checkpoint, 3.1, draws students' attention to what they are already familiar with, which might include good study habits, the name of the university's academic integrity policy or even some basic definitions. This will ensure an equitable starting point for all students. The second checkpoint, 3.2, focuses on how to best present and organize concepts and new information to facilitate understanding. This might include highlighting key concepts or using graphs or diagrams. Of particular importance is the use of illustrative examples for unfamiliar or confusing definitions. Following this, checkpoint 3.3 refers to selecting information to guide the presentation and integration of new information by making it more cognitively manageable; the guidelines suggest chunking or progressively

 

releasing information. Davis suggests consistent formatting (such as font style, numbering etc.) and limiting detailed explanations. Finally, checkpoint 3.4 advises providing ways to transfer the acquired knowledge to new situations, which is key to success. This might include checklists, opportunities for review and case studies. These adjustments ensure that the material is more readily understood and as a result, more accessible for all students.

Because it is possible to apply UDL principles and not be accessible for everyone, Greene (2022) suggests a two-fold approach to attain equity by applying both UDL and WCAG.

#### *1.1.5. Web Content Accessibility Guidelines*

The *WCAG* framework is commonly used by web designers and content editors as the standard for determining the degree of digital accessibility of web content for people with disabilities. WCAG conformance success criteria are identified on a three-point scale of A, AA, AAA.

According to the four principles of the WCAG Guidelines 2.1, web content should be **perceivable** by more than one sense; **operable,** so that different users should be able to use the interface and its navigational components; **understandable**, the interface and its content should be easy to master; and **robust,** with the content compatible with different types of assistive technologies and tools.

### 1.2 Research Questions

The purpose of the current study was thus to verify that the UDL improvements reported in Rosales & Dewart (2022) attain a minimum of AA or higher according to WCAG 2.1 conformance and to determine which improvements are to be made in the next round of development to achieve a rating of AA or higher in relation to the comprehension set forth in UDL.

1. To what extent does the LMS module comply with UDL guidelines for comprehension?
2. Does the LMS comply with WCAG guidelines?
3. What are the current research recommendations regarding artificial intelligence relating to academic integrity?

## 2. Method

### 2.1 Context and participants

Credited undergraduate ESL courses are offered at a university in Montreal, Canada. The courses range in level from beginner to high intermediate, and the student population ranges in age from early 20's to mid 60's. Some students take English courses as part of another program (as a requirement or an elective), others are completing an English language program, and a minority of students are independent students (unassociated with a program).

The programs include courses that focus on linguistic notions including grammar, pronunciation and syntax; communication skills in combined and separate formats including writing, reading, speaking and listening; and culture-specific courses such as literature, the history of English and sociolinguistics.

Since 2017, a learning module about academic integrity has been integrated into all ESL courses. However, before 2019, all classes were offered on campus, and that year three courses were introduced in two formats (two asynchronous and one synchronous). The following year, because of the global pandemic starting in March 2020, all classes were offered in an online format.

To date, student comprehension of academic integrity has been measured using test results from the ten-question LMS module as well as investigating the number of infractions reported to the university's committee of academic infractions.

 

### 2.2. UDL comprehension guidelines

Referring to the four checkpoints for the UDL sub-point of comprehension, the academic integrity module content was analyzed using the explanations and examples from the UDL website: activate or supply background knowledge (3.1); highlight patterns, critical features, big ideas, and relationships (3.2); guide information processing and visualization (3.3); and maximize transfer and generalization (3.4). Each checkpoint provides an explanation and suggestions for different types of content, which were used to assess the resource and its delivery method. Using a yes/no scale, each of the four checkpoints was either deemed to be completed successfully (if no additional adjustments needed to be made) or unsuccessfully (if improvements could be made).

### 2.3. WCAG checklist

The official website of WCAG Guidelines was consulted as well as other simplified checklists. A 10-page checklist (WEBAIM), available at https://webaim.org/standards/wcag/checklist, was chosen to evaluate the module's WCAG 2.1 conformance to the success criteria. The decision to use this checklist was based on its easy-to-use checkbox format for each criterion and its rating of accessibility (A, AA, AAA).

The first principle, **Perceivable** has four guideline subgroups, each containing one or more criteria (the total number is in parentheses): text alternatives for any non-text content (7); time-based media (7), adaptability (10) and distinguishability (19). The second principle, **Operable**, has five subgroups: keyboard-accessibility (5) and navigability (16), time to complete tasks (7), seizure prevention (3), and format for inputting information (8). The third principle, **Understandable**, determines the readability of the content (6) and predictability of the formatting (6) and the availability of input assistance (10). The only subgroup of the fourth principle, **Robust**, concerns the compatibility of the web content with other technologies.

The Moodle LMS adopted by the university is version 4.1.9+ (Build: 20240402). Moodle 4.0 already achieved WCAG 2,1 AA Accessibility Compliance (Moodle, 2024), so it is safe to assume that this university's later version of Moodle is already AA compliant. Again, using a yes/no scale for each criterion within the control of content editors, two judgments were possible: "Yes" for pedagogical decisions made by the content editors at the time of creation, and "No" for aspects of the content that were not WCAG compliant.

### 2.4 Academic integrity guidelines for the use of artificial intelligence

The LMS module does not currently address the use of artificial intelligence as it is left to the instructor's discretion. Three reputable international organizations for academic integrity were consulted (*International Center for Academic Integrity (ICAI)*, *European Network for Academic Integrity (ENAI)* and *Partnership on University Plagiarism Prevention (PUPP)*) and while there are several checklists for both teachers and students available, the ENAI recommendations (Foltynek et al. 2023) were selected because of their concision and scope in addressing pedagogical issues without imposing on the instructor's independence.

## 3. Results

Verifying the UDL comprehension guidelines, only one of the four checkpoints was done successfully (checkpoint 3.3). Checkpoint 3.1 (activate or supply background knowledge) was deemed unsuccessful. Even though there was a definition of plagiarism, it was acknowledged that additional background information would benefit students, particularly those who are not already familiar with the term "academic integrity" or the official name of the school policy. Furthermore, a glossary was added with linked definitions throughout the module providing additional context for students for whom this is a new concept. For Checkpoint 3.2 (highlight patterns, critical features and big ideas and relationships), illustrative examples were added for each definition integrated in the new glossary. Checkpoint 3.3 (guide information processing and visualisation), which reflects consistent use of tools to emphasize key points, was already addressed consistently as was the approach of "chunking information" by addressing one point with a clear heading followed by two to three questions on each page. Checkpoint 3.4 (maximize transfer and generalization) is perhaps the most significant improvement: the inclusion of a bank of

 

randomly generated case studies providing an opportunity for students to apply their knowledge. Because students see this module in all ESL courses, they will review the concepts and will transfer their knowledge to a new case study question each time they complete the module.

While many of the WCAG guidelines are already met by virtue of being a module within Moodle, which is WCAG 2.1 compliant at level AA, the focus of this analysis was further limited to content development. Some criteria of the first principle, **Perceivable,** also went beyond the scope of content development. For example, Moodle limits the use of colour and line spacing. However, the criterion of the subsection 1.3.1 Adaptable: Info and Relationships, prompted adjustments. Adaptability was ensured by verifying that bolding was used consistently, and the coding for enlarged text was reflected in the appropriate HTML heading size (h5).

Under the **Operable** guidelines, the module has no time limit and does not use animations, so the criteria were met by default. However, under the guideline of the subsection 2.4.4 Navigable: Link Purpose, the links directing to university resources were changed to reflect the content of the page rather than simply using the name of the website. For example, rather than repeating the name of the page, *Infosphère*, a more descriptive text is now used for the link description: "*Infosphère*: citing sources" and "*Infosphère*: paraphrasing" as they direct to two separate sections on the website.

The **Understandable** guidelines in section 3.1.1. Language of Page suggest forcing the language in the settings to prevent automatic translation and any resulting mistranslations of text by adaptive technology. This will need to be addressed by teachers as they integrate the module in their courses. Furthermore, section 3.1.3 Unusual Words suggests a glossary for ambiguous vocabulary, which was also mentioned and suggested in the UDL guidelines and was added as a result. Finally, section 3.1.5 Reading Level suggests addressing a grade 9 level of reading proficiency. Because the module was created with all learners' needs in mind, it is suitable for low proficiency language learners.

The criteria for **Robust** was not relevant as it went beyond the scope of content development.

## 4. Discussion

The goal of this project was to determine if UDL and WCAG could be used together to improve equity of an LMS academic integrity resource among diverse student populations. Analysis of the module reflects the efficacy of Moodle as a strong starting point for equity, but the teacher plays an important role developing content to ensure comprehensibility, equity and accessibility.

As research (Davis, 2023; Eaton et al., 2017) has suggested, academic integrity is a skill to develop and must begin with meeting the students where they are and providing information that is accessible to promote a more equitable learning environment. For example, because of the generative nature of artificial intelligence and its ability to mimic human language, additional training in a language classroom about how to use ChatGPT ensures that students are informed about what is expected of them regarding AI (as a cited source and including prompts used).

While the development of this module was intended to address the specific needs of language learners and had been effective for several years, this analysis pointed out several areas where it could be improved to promote a more equitable and accessible learning environment. Furthermore, because the module informs students about academic integrity, the integration of information about AI in language classes is essential for clarifying its use and limitations, and further ensures that students begin their courses in an equitable way.

Additional strategies for enhancing academic integrity underscore the importance of educative over punitive approaches (Davis, 2022; Eaton, et al., 2017), such as clarifying objectives and scaffolding activities (Pecorari, 2016), revisions in the academic writing process (Peters, 2021), and the inclusion of honour codes (Béland et al. 2020; Konheim-Kalkstein et al., 2008).

 

## 5. Conclusions

UDL and WCAG provided two approaches for improving comprehensibility and accessibility, and the additional information reflecting the ENAI guidelines raises awareness about AI and academic integrity. As previously stated, research promotes preventative approaches to academic integrity, and because it is a skill that is developed over time (Davis, 2023), it is acknowledged that this module is one step in a much larger process. It is also acknowledged that the revisions reported in this paper may not resolve all instances of academic infractions, as a successful preventative approach must include ongoing support in the classroom. Future research will report on the improvements made and issues that persist. However, to date, it is worth noting that the development of this module has brought an institutional awareness and support to the specific needs of students studying in an additional language and their use of AI.

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# Where the reader wanders, learning follows: Promoting accessibility, equity and inclusivity in an online literature course

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***Abstract***

*Existing research on the use of literature with language learners promotes pre-reading activities to provide cultural background information before students begin reading to avoid issues of perceived inaccessibility (Lazar, 1990; Weng, 2012). More recent studies have highlighted the importance of cultural familiarity, which, when promoted with well-designed activities, has been shown to improve comprehension and retention for learners of a second or foreign language (Kuhi et al., 2013; Sheridan et al., 2019). In this project, a walking tour of a neighbourhood in Montreal, Canada, which was used as a pre-reading activity to promote familiarity with the cultural background of the text (Lazar, 1993), was adapted for a synchronous online learning context and offered using the course learning management system (LMS). Students' experience reading the novel and their appreciation of the cultural context were positively impacted by this independent learning activity. The next stage of the project aims to enable more learners to participate by further exploring options to promote accessibility, equity, and inclusivity (Education Links, 2024) and present a dynamic experience for students who cannot explore the streets in person and make the activity appropriate for all learning modalities and varied student constraints.*

***Keywords:*** *accessibility; inclusion; literature; LMS.*

## 1. Introduction

While reading literature can help make a language and culture come alive, walking the streets described in a book and locating the places mentioned in that story can take language learning to a new level – particularly when readers are invited into unfamiliar spaces, such as that of a minority group with a long history in a city. The current paper presents the adaptation of an interactive reading activity that supports learners' cultural awareness before beginning to read a non-adapted English book in a literature course. More specifically, a literary walking tour was modified for students with diverse limitations.

Following an explanation of the activity design and implementation, improvements related to accessibility, equity, and inclusivity, as well as adaptations for different contexts, are presented, including possibilities for gamification and assessment.

 

## 1.1. Literature review

### *1.1.1. The place of literature in the language class*

Because literature can be used for diverse aspects of language learning, it has long held a secure place in the teacher's toolbox. Literature can be used to foster language acquisition by exposing learners to authentic language usage, including vocabulary, grammar, idiomatic expressions, and linguistic structures. It is often used to promote reading and writing skills or developing communication skills with role plays and discussions. Literature can also support critical thinking as students engage with complex ideas, themes, and characters, which fosters their ability to interpret and evaluate information. Through exposure to myriad literary devices, such as metaphors, irony and characterization, students develop analytical problem-solving skills. Most notably literature is associated with deepening cultural understanding and providing insights into a cultural history and its society. By exploring literary works from different time periods, regions, and perspectives, learners gain a more complete understanding of the cultural context associated with the language they are learning. For learners who have relocated to a new city or region, literature can provide an indispensable link between the language students are learning and the land they are discovering.

### *1.1.2. Pre-reading activities for cultural familiarity*

The inclusion of **pre-reading** activities provides students with an opportunity to activate any background knowledge they have related to the culture. These activities may include information about the author, exploring the time and place presented in the novel and discussing the variety of English used among others. Lazar (1990, 1993) notes that cultural background presents a considerable challenge for learners and "may seem inaccessible to them and may also interfere with their understanding or crucial elements within the text" (1990, p. 209). As a result, she suggests it is best to address this before starting to read. As an illustration of the importance of pre-teaching activities related to culture specific readings, Kuhi et al. (2013) looked at the impact of pre-teaching vocabulary related to culture specific texts and found that this had a significant impact on the learning outcomes when compared with a control group. Furthermore, by cross-referencing student language levels and their familiarity with cultural topics, Weng (2012) demonstrated that ESL student reading comprehension was positively correlated with cultural familiarity. This highlights the importance of students being aware and comfortable with the culture before beginning a reading for maximum comprehension. Additionally, research by Sheridan et al. (2019) explored the impact of using culturally familiar proper nouns in English language newspaper articles about Japan (in place of culturally unfamiliar proper nouns) and found that this had a positive impact on both reading comprehension and vocabulary retention. In short, the more familiar a story feels, the more students can relate to it and this improves their understanding of the text.

### *1.1.3. Canadian context*

In a similar vein, a more inclusive design of course materials ensures that more students can benefit from the lesson. Canada is committed to apply the UN *Convention Rights of Persons with Disabilities*, which are under international law and state that every person should have access to "general tertiary education, vocational training, adult education and lifelong learning without discrimination and on an equal basis with others" (Article 24). Researchers investigating legal decisions related to disabled post-secondary students in Canada from 2014 and 2021, found that 72% involved in-program accommodations (Jacobs, 2022), and of these, 38% were related to mental health issues. These findings are of importance because they reveal that students with disabilities who continue to feel that their human rights are not being respected are dissatisfied with in-class accommodations and that when considering students' needs, many of these students cannot be physically identified. This suggests that teachers might be overlooking the needs of many students if all class activities are not made inclusive. Taking a proactive approach to materials design and development with accessibility, equity and inclusivity in mind benefits all students by reducing potential stress and anxiety with well-designed materials intended for all learners.

The government of Canada uses the following definition of accessibility (as cited in Pagaling et al., 2022):

 

- **Accessibility** - creating communities, workplaces and services that enable everyone to participate fully in society without barriers.

Importantly, this definition highlights putting everyone on an equal playing field rather than adapting resources for the particular needs of diverse disabilities. UNESCO's Global Education Monitoring (GEM) Report (2020) defines equity and inclusion as follows:

- **Equity** - A process or actions aimed at ensuring **equality** (all members of a group enjoy the same inputs, outputs or outcomes in terms of status, rights and responsibilities).
- **Inclusion** - A process consisting of actions and practices that embrace diversity and build a sense of belonging, rooted in the belief that every person has value and potential and should be respected.

It is notable that *inclusion* aims to build a sense of community through respect for each person's potential. It is not tied to a disability or diversity that might be overlooked. It is simply based on considering the diverse needs of learners in general. In light of this, accessibility, equity and inclusivity in adult education may include a broad range of possible issues. Several factors which may be overlooked in the design of engaging activities in adult education include those relating to mobility, which may limit a student's capacity to participate in on-site activities; mental disabilities and neurodiversity, which may require accommodations to address complications with group activities, additional stress, and difficulty processing with distractions, etc.; work schedules, as many students have full-time jobs and may not have flexible schedules; and students with families, as they may have other priorities and limitations, particularly recent immigrants who may have limited support, placing them at an increased disadvantage (Conrad, 2020), as well as women, as they are less likely to participate in adult education for family-related reasons, according to the *UNESCO GEM Report* (2020).

## 2. Method

### Context and participants

Historically, Montreal has long been a bilingual city with four major universities, two in French and English each, and with both linguistic cultures present in different neighbourhoods throughout the city. One neighbourhood, which literally straddles the traditional linguistic divide of the French in the east part of the city and the English in the west part, is called the Mile-End, and it is home to a Hasidic Jewish community who are Yiddish speaking and trilingual. Jewish people were integrated into the English language education system, and as a result, the Mile-End is also home to a large English-speaking population. Because this neighbourhood is traditionally Hasidic and has been increasingly anglophone, it is less familiar to many francophones and new immigrants.

In a university credited language program at a French-Canadian university, students study English as a second language (ESL) or as an additional language. The course referred to in this paper is an upper intermediate (B2) introduction to contemporary English literature. It is offered in two formats, both meeting once a week for three hours: a daytime in-person format meeting on campus, and an online synchronous format meeting in the evening using Zoom. The students in this ESL course are usually French speakers in their 20's and slightly more mature speakers of other languages (in their 30's to 50's). Both groups of students are somewhat less familiar with Montreal and its minority communities/neighbourhoods.

#### *Course context*

A literary walking tour has been a pre-reading activity used in this course previously when students met in person. It was presented as a type of field trip taking place during the regular course hours. However, when the course was offered in an asynchronous format during the evening, this traditional walking tour could not be offered during the regular course hours because some of the students did not live in Montreal, and they were already required to attend a theatre performance during the semester. In addition to this, some of the students had children at home with them while they were studying. For this reason, the activity was reworked to meet the needs of this particular

 

group of students. As the activity was modified, it became clear that additional changes could be made to make it more inclusive. As a result, the adaptation of the activity happened in two stages.

First, the activity was presented as an optional extra-credit activity for the synchronous format. Students were presented with a map and audio files which were shared in the course LMS (Moodle). Each point on the map corresponded by number to the audio files which included two types of recording for each point: historical information about the location and a related excerpt from the novel. Students were instructed to follow the itinerary presented, and for extra-credit they were asked to identify architectural features of a building that was a former synagogue and to take a photo of themselves in front of another building that was significant in the context of the novel.

A moderate rate of participation was as expected as this was an optional activity, but it led to a reflection about how this activity could be further modified to be more inclusive and accessible to foster equity for all of the students in the course. Providing the walking tour content in Moodle with instructions for the self-guided walk still excluded students who had difficulty traveling to Montreal (or potentially those with mobility issues) and those who simply didn't have the time for this type of field trip. As a result, an alternative was sought that would not require students to physically relocate and which would instead enable all students to benefit from the cultural background information that was presented in this format.

The second stage of the activity adaptation sought a more interactive format to present the literary tour without requiring any physical displacement. Additional tools in Moodle were explored such as a book tool, but the available options were limited in functionality and scope. Similarly, using conventional online map tools, such as *Google Earth* or *Google Streetview*, would limit students to a map without accompanying audio (or textual) information. For this reason, *ArcGIS StoryMaps* was chosen, as it is a web-based application that enables users to create interactive maps that incorporate a thread of information that can includes a variety of media including texts, videos and images. In this format, students can both read and watch a video presentation of the same information. This feature is appealing because it addresses the needs of different learning styles and supports learners with diverse needs.

## 3. Results

Seven of twenty students in the synchronous course participated in the optional self-guided tour of the Mile-End neighbourhood using the materials provided in the LMS. These participants reported during informal class discussions that the optional literary walk helped them to understand and appreciate the story with additional historic and cultural information. They also reportedly enjoyed exploring an unfamiliar neighbourhood, valued the exposure to the minority Hasidic community that they knew little about, and appreciated visualizing the setting of the story. The photos that students submitted revealed that they participated at varying times of the day, with some opting for day visits and others preferring evening visits, as well as on different days, as the weather varies considerably in the autumn months and their clothing reflected this (some in T-shirts and others with hats and scarves). A couple of students noted the need to download the audio and pdf files before starting the tour to avoid using data on their phones. Considering this, the activity is currently being developed using *ArcGIS StoryMaps* to be used in future iterations of the literature course.

## 4. Discussion

The objective of the activity in this course was to promote learner engagement and interaction with the world around them by inviting students into the neighbourhood and exploring the culture of a minority group in a major city. In light of previous research presented relating to the importance of pre-reading activities when the cultural context is unfamiliar (Kuhi, et al., 2013; Sheridan, et al., 2019), it is worth considering how this activity can be used in its modified format (using *ArcGIS StoryMaps*) when students are reading a novel that is set in a distant place. By identifying the unfamiliar and foreign as a place on a map, it becomes real. Streets, rivers and important

 

institutions may have different names, but the place becomes familiar and relatable, particularly when images and/or videos can be included.

Another potential activity to consider is asking students to work in groups and research a setting from a novel and collaborate to create a map using the course LMS or *ArcGIS StoryMaps*. When the resources are shared, students have an opportunity to revisit the places identified through another lens. Students don't have to leave their chairs to explore, but if the setting is accessible, some of them may be inclined to explore further. What is important is that they don't have to travel to benefit from the activity. To include an aspect of gamification, a treasure hunt could be included, whereby students must explore the images or map locations to find specific information (such as the features of a building, or the former name of a historic building. An associated assessment could also be explored either in association with this type of activity or by verifying reading/listening comprehension following the activity.

Furthermore, for language teachers covering additional content courses, the application could be used by students to explore new places (cities or countries) and then sharing their map projects in this digital format with their classmates.

## 5. Conclusions

The title of the EUROCALL 2024 conference *Call for Humanity*, reminds teachers and researchers to not lose sight of the people in the classroom. *Humanity* is people, but it is also the kindness that we show one another. With this theme guiding this year's conference and with the knowledge that the United Nations identify post-secondary and adult education as a human right making for a more just society, it is essential for educators to ensure that every activity that is proposed to students is inclusive and accessible. Courses are increasingly being adapted for online learning, and although the value of engaging with the surrounding environment remains a resource to explore, it just might look a little different for learners with diverse needs.

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# Learner assessment in CALL

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# Development of an application to test young L2 learners' phonological awareness autonomously

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***Abstract***

*Phonological Awareness (PA) plays a crucial role in L1 and L2 reading acquisition and L2 pronunciation, but its relation to L2 listening has been studied to a lesser degree. In order to study the relationship between the development of PA as a meta-skill and the use of a foreign language app targeting listening skills for young learners, a reliable test was needed. The goal of this study was to design a PA test in English and in French to be administered on tablets, taken by French children autonomously (without the need for one-on-one administration) and assessed automatically. This requires the tasks to be transformed into selected response tasks to be automatically scorable. In order for instructions to be comprehensible to young learners they must be carefully scripted, illustrated and contextualized (in our case, with a family of monsters enjoying words starting or ending with certain sounds).The application was tested with 65 intact classes of 1st graders (6-7 years old) learning English in France, whose schools participated in a larger project focused on L1 French reading fluency and L2 English listening comprehension. It proved to be usable and reliable. Further validity studies are planned.*

***Keywords:*** *phonological awareness; young learners; English as a foreign language; language testing; tablet application.*

## 1. Introduction

Phonological Awareness (PA), or the ability to manipulate segments of spoken language, is one of the cognitive factors that determine the level of competence in both native (L1) and foreign (L2) languages. Given its importance, various PA tests have been developed in different languages. In this article, we describe the development of a PA test in two languages (English and French) to be administered on tablets, and to be taken by French first and second graders (six to seven years old) autonomously and assessed automatically.

This study is a follow-up to a larger project (Mandin et al., 2021) in which two tablet apps were developed to teach L1 French reading fluency and L2 English listening comprehension to French first grade schoolchildren.

After finding an unexpected effect of the L2 English app on L1 French phonological awareness, we decided to investigate the effect and develop our own PA testing tool, using tablet-based exercises to facilitate test-taking and data processing for future experiments.

## 2. Defining and testing phonological awareness in second language learning

### 2.1 Definition of phonological awareness

Phonological awareness has been the subject of much research since the late 1970s and early 1980s (for a review, see Gillon, 2018), and several definitions of phonological awareness have been proposed. According to Anthony and Francis (2005, p. 256), "phonological awareness refers to one's ability to recognize, discriminate, and manipulate the sounds in one's language, regardless of the size of the word unit that is the focus". It is a metacognitive skill in the sense that it requires being able to focus on the form (the sounds) of the linguistic material regardless of meaning, clearly distinguishing phonological awareness from normal communicative use of language. The term 'awareness' implies a certain degree of conscious control, i.e. it is not just a question of being able to discriminate between different sounds or minimal pairs (phoneme discrimination) but requires the ability to compare or create new (nonsense) forms regardless of their meaning (or absence of it). Language thus becomes an object of observation and reflection (White & Ranta, 2002).

The size of the phonological units that speakers are able to manipulate seems to depend mainly on maturity. Carroll et al.'s (2003) study with 67 preschool children indicates that children first develop their implicit sensitivity to large units of language (syllables and rhymes) before becoming sensitive to smaller units such as phonemes. Some authors defend the idea that these are separate skills, while others support the hypothesis of a continuum with a single skill that gradually evolves from the processing of the largest units, i.e. syllables, to the processing of the smallest units, i.e. phonemes (Anthony & Lonigan, 2004; Goswami & Bryant, 1990), via infra-syllabic units (onsets and rhymes). Phonemic awareness is initially more difficult to acquire than syllable and rhyme awareness, and develops as we learn to read (Hoien et al., 1995; Liberman et al., 1974).

Phonological awareness is a key component for the different language skills. It has long been a focus of study in L1 reading and writing skill development, and phonemic awareness, in particular, has emerged as a key precursor of L1 reading acquisition (at least in alphabetical languages). It has also been implicated in L2 reading (Haigh et al., 2011) and L2 pronunciation (Kivistö de Souza, 2015), but its relation to L2 listening has been studied to a lesser degree (Li et al., 2013). More generally, as a cognitive variable, it has been shown to be correlated with the lexicon and morphosyntax for both L1 and L2 speakers (e.g. Hopp et al., 2019).

While some studies have looked at the links between phonological awareness in L1 and L2, Melby Lervåg and Lervåg's (2011) meta-analysis pointed out that "[t]he fact that we found significant correlations between L1 and L2 on [...] phonological awareness skills can be seen as evidence for cross-linguistic transfer. It should be noted, however, that the findings only demonstrate a relationship, and not the mechanism that causes it" (p.128). This is in line with the work of various researchers who consider phonological awareness not to be language-specific, but to be a general meta-linguistic skill (Comeau et al., 1999; Cummins, 1979). The results of the initial project (alluded to above) in which the use of an English listening app was found to increase PA in French seem to concur with this hypothesis.

### 2.2 Traditional phonological awareness tests

Traditionally, phonological awareness tests focus on one language at a time, for example English (CTOPP), French (N-EEL, Chevrie-Muller & Plaza, 2001; BALE, Jacquier-Roux et al., 2010), or German (BAKO, mentioned in Kersten et al., 2024). Also, because these tests are often used for their predictive power of future reading skills they are calibrated with a native population. Although some researchers have used tests designed for native speakers as part of their research into L2 learning (Magnat, 2013), they acknowledge that this use with non-native populations is not optimal if learners know that the test is in a foreign language and if they lack the lexical knowledge required. Finally, these tests are often only commercially available and are not free or open access.

In terms of test task characteristics, as mentioned above, PA test tasks can vary as to the size of units being manipulated (in order of decreasing difficulty): phonemes, rhymes or syllables. The tasks themselves usually belong to the following categories:

- comparison tasks, comprising judgment tasks (e.g. do these two words rhyme, or does this word contain this sound?), similarity tasks (which word starts/ends with the same phoneme?), and oddity tasks (e.g. which word does not start/end with the same sound(s) as the others?);
- counting or positioning (how many syllables are there in this word, or where is this sound in this word?);
- manipulation tasks are the most commonly used (here, examples with phonemes): segmenting a word into phonemes, blending phonemes to make a word, deleting a phoneme from a word, substituting one phoneme for another, reversing the order of phonemes in a word.

From the test takers' point of view, judgement tasks can be answered with ‘yes’ or ‘no’, oddity and counting tasks with a number (the number of the odd one out for oddity tasks), but manipulation tasks require learners to produce spoken language, which is always more difficult for L2 speakers.

Most of the time, PA tests are administered by a trained therapist, teacher, researcher or assistant. Training is necessary, especially when the tests are normed (i.e. performance on the test can be interpreted by reference to a larger population, ALTE, 1998, p. 154), in order to ensure that scoring is consistent with instructions and that future decisions based on scores are valid (knowledge of the phonetic alphabet is also sometimes necessary). Administration requires one-on-one time with each child and funds to pay for the tests. Additionally, they are often pen-and-pencil tests (e.g. BALE for French), and require the answers to be transferred to a spreadsheet afterwards if group results are to be analyzed for research purposes. Computerized tests do exist: in French, for example, a test was developed by Sprenger-Charolles et al. (2005), but it is still administered by an adult one-on-one (its main advantages being automatic scoring and response time availability). We also do not know whether it is still available and are not aware of any recent studies having used it for research. Other initiatives have arisen to develop technology-based tools and proven that they could be as reliable as paper-based tests (Carson et al., 2014; Kiss & Csapó, 2024; Meira et al., 2023).

In summary, traditional tests of phonological awareness focus on the manipulation of phonological elements in a single language. In this sense, they are not consistent with one of the hypotheses about phonological awareness, namely that it is not language specific. It is also worth noting the limitations of conventional tests: they have to be administered by one person to each learner individually, which requires time and qualified human resources. Because of these drawbacks, we set out to design a PA test in two languages (English and French) to be administered on tablets, taken by children autonomously and assessed automatically. The development of the test and its large-scale field testing to make sure that it is usable and reliable will be described in the following sections.

## 3. Methods

### 3.1 Test design features

The obvious choice for a technology-based test is to use tablets (Charles et al., 2022). Tablets are cheaper than computers and take up less space, making it easier to equip an entire class. Moreover, most children are familiar with tablets and are enthusiastic about using them.

In order for children to take the test autonomously, the instructions must be as short as possible, simple, and accompanied by several training items before scored test items can be administered. All instructions (provided here in French since it is the learners’ L1) must be spoken to make sure that children who cannot yet read can understand them. Additionally, to ensure engagement and aid comprehension, it is useful to contextualize the tasks. To this end, a group of colorful monsters was created, called Monstruas or Monstruos, who like to play with sounds and need help to achieve various goals (usually eating their favorite foods). A screenshot of the interface is provided in Figure 1.

The second requirement is for tasks to be automatically scorable. This means that no oral answers are possible (unless automatic speech recognition were to be used, Wills et al., 2023), and that all items need to be transformed into selected response tasks, where answers are given by clicking on the correct option or by dragging it to a drop zone. Moreover, for some tasks, it is common in monolingual tests to have the participants rely on their lexicon and choose from images without the words being pronounced (Kiss & Csapó, 2024). Since the learners had little or no vocabulary in L2 English we told them that the items (in French and English) were non-words, thus inviting them to focus on manipulating phonological elements independently of meaning. This was modelled on part of the CTOPP (English) and N-EEL (French) tests. Non-words were represented visually by invented objects or food. Finally, in order to test the hypothesis that PA is a cross-linguistic skill, items in two languages were included (French and English).

Our test is thus composed of four subtests addressing the three levels of granularity (rhyme, syllable and phoneme) and using four types of PA tasks (oddity and similarity judgment, blending and segmentation). Each task contains between 16 and 24 items of increasing difficulty, alternating between French and English and male or female speakers:

1. In the syllable blending task (Figure 1) the child needs to select the item resulting of the blending of two syllables by touching one of the 3 symbols at the bottom of the screen.

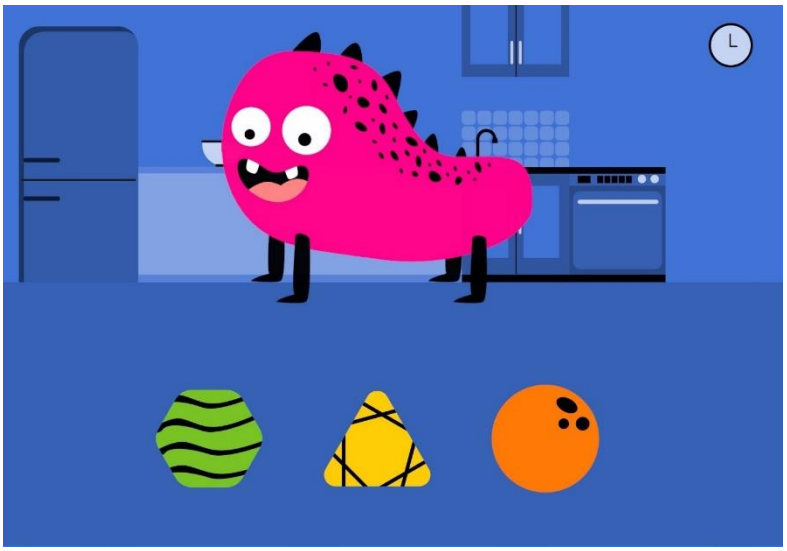

Figure 1. Screenshot of the interface for the syllable blending task.

2. In the phoneme segmentation task (Figure 2) the child first hears a non-word then touches the four symbols at the bottom of the screen to listen to four different phonemes, then drags each one to the correct position in order to reconstruct the non-word (one of the symbols is a distractor phoneme).

Figure 2. Screenshot of the interface for the phoneme segmentation task.

3. In the rhyme similarity task the children select the item (out of three) that rhymes with the name of the monster. The interface is similar to Figure 1 with a different monster and a different color background.

4. In the initial syllable oddity task (also with an interface similar to Figure 1) the goal is to select the item that does not start with the same syllable as the others.

As mentioned above, this test was part of the post-test for a research project. The various tasks were carried out in three sessions, with automatic blocking between sessions to prevent learners from doing several sessions in succession. In the first session the syllable blending task was taken immediately after an English listening comprehension test. The second session consisted of the phoneme segmentation task. The third session included the rhyme similarity task and the initial syllable oddity task.

### 3.2 Experimental design

The application, called 'Evalulu' was tested with 652 first graders (six to seven years old) learning English in France, whose schools participated in a larger project focused on L1 French reading fluency and L2 English listening comprehension. They belonged to 52 intact classes. The pretest for the larger experiment served as a pilot, after which the worst performing items and tasks were discarded for the post-test, mostly because they were too difficult (for example, there was initially a phoneme inversion task which was not kept). Some instructions were also simplified or reworded to make them easier for the children to understand. The pilot also enabled us to order items in order of ascending difficulty within each task. Here, we present the results of the post-test which took place at the end of the school year. All analyses were performed with *R.*

## 4. Results

### 4.1 Usability

All teachers were able to organize administration within their classes in the way they thought was most appropriate. Each class had between four and six tablets, and children took the test in small groups autonomously with headphones while the teacher worked with other students in the same classroom. It must be noted that the children (and their teachers) were familiar with the use of tablets since they had been using them for the duration of the school year.

All answers were collected automatically either during the test (in classrooms equipped with Wi-Fi), or after test administration by connecting the tablets to Wi-Fi. Because of log malfunction the time needed to complete the test is not known at this time.

### 4.2 Reliability and item characteristics (difficulty, discrimination)

As can be seen in Table 1, all tasks proved reliable (internally consistent), with Cronbach's alpha values above .7 (Laveault & Grégoire, 2014, p. 119) and reaching .91 for the segmentation sub-test. The range of item difficulty was also acceptable, with values between .2 and .8 (Bachman, 2004, p. 138), although the last two tasks were still difficult for this population (no item of syllable oddity or rhyme similarity judgment was successfully attempted by more than two thirds of our sample).

**Table 1.** Summary of test task characteristics: number of items, Cronbach's alpha, range of item difficulty, (numbers in parentheses correspond to discarded items), range of item discrimination, and mean score.

| Id | Task | # items | α | Item difficulty | Item discrim. | Mean score (sd) |
|---|---|---|---|---|---|---|
| 1 | Syllable blending | 16 | .78 | .53 – .74 | (.17) .28 – .43 | 10.5 (3.61) |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2 | Segmentation | 24 | .91 | .30 – .77 | .35 – .68 | 13.77 (6.64) |
| 3 | Rhyme similarity | 16 | .71 | (.17) .35 – .66 | (-.17) .18 – .50 | 8.11 (3.34) |
| 4 | Syllable oddity | 16 | .72 | .34 – .58 | (.15) .19 – .47 | 7.45 (3.43) |

Test items also need to display adequate discrimination, i.e. higher-level students need to be more successful at them than lower-level students (the index used is a point-biserial coefficient, which is a correlation between item score and total test score excluding the item). The minimum acceptable value is considered to be .15 or .2 (Laveault & Grégoire, 2014, p. 211). Because some items had low discrimination values we discarded the lowest performing item in three sub-tests (syllable blending, rhyme similarity and syllable oddity), resulting in 15 items for these sub-tests. The segmentation sub-task, while being very different from a classical segmentation task requiring learners to produce phonemes aloud, proved especially successful, with all 24 items performing very well with a wide range of difficulty and high discrimination indices.

## 5. Discussion

Our first goal was to make sure that the test was usable (a test characteristic called *practicality* by Bachman & Palmer, 1996, p.35-37) and that young learners could indeed take the test autonomously on tablets. Teachers did not report major problems with test administration, scheduling, etc., and small groups of students were able to complete the test while classroom teachers continued teaching other groups. We conclude that the features we used to make the test more child-friendly (simple instructions, friendly monsters to contextualize the tasks) were successful, and that the test is usable by primary school teachers during class hours. Our results are in accordance with those of Carson et al. (2014, for English), Kiss & Csapó (2024, for Hungarian) and Meira et al. (2023, for Portuguese), who also developed computerized tests and used recorded, child-friendly instructions (Kiss & Csapó, 2024; Carson et al., 2014), child-appropriate pictures (Kiss & Csapó, 2024; Meira et al., 2023) or characters (an alien in Carson et al., 2014) to contextualize PA tasks and motivate the children. This confirms the usefulness of gamification features that are known to promote motivation, such as stories and characters or avatars (Sailer et al., 2017), when developing a test aimed at young children.

The second goal of this study was to make sure that our test was reliable, i.e. that the use of the test on separate occasions would yield similar results. As a proxy, we used a commonly accepted measure of internal consistency, Cronbach's alpha. Each of the subparts (tasks) composing our test displayed adequate levels of internal consistency. We can thus conclude that the reliability of the test is satisfactory. This confirms results of previous studies such as Kiss & Csapó (2024), who showed that a PA test taken autonomously on tablets could be reliable. However, the procedure for test administration was different in their case, since children took the test in groups of five in a quiet room with two adult assessors present to answer their questions and solve any problems. Our study shows that even in less controlled conditions with less supervision (children taking the test in small groups in the classroom while the teacher is working with other students) a computerized PA test can still exhibit satisfactory reliability. However, the students knew they were taking part in an experiment and this might have skewed the results. Replication with a more typical group would be useful.

Finally, our test was made up of different tasks (blending, segmentation, similarity and oddity) aimed at different phonological units (syllables, rhymes, units). Although tasks focusing on smaller units (phonemes) are usually found to be harder, we did not find evidence of such a trend in our study. For example, the two tasks aimed at syllables (syllable blending and syllable oddity) were respectively the easiest and the hardest tasks, and the phoneme segmentation task was easier than both the syllable oddity and the rhyme similarity tasks. Our results are in line with those of Kiss & Csapó (2024), who also found that task difficulty seems to be determined less by phonological unit size than by the cognitive operation required.

## 6. Conclusion, limitations and further research

This project has enabled us to develop a usable and reliable phonological awareness test that can be taken autonomously on a tablet by young learners. All four PA sub-tests proved to be reliable, of adequate difficulty, and discriminating well between low-performing and high-performing learners. However, students and their teachers taking part in this study were already familiar with the use of tablets. With students who are new to them, a period of familiarization might be necessary before taking the test itself.

The initial aim was to meet our research needs in applied linguistics, but also the needs of teachers to assess the level of their learners. The experiment highlighted the fact that teachers can administer the test on their own, and that this saves resources compared with a conventional test. As far as future developments for teachers are concerned, we now need to work on designing a dashboard on which teachers can consult the results obtained by learners. We have been able to provide evidence for several aspects of validity (Hughes, 2002). Apart from reliability we have also explored content validity, by showing that the test covers different aspects of phonological awareness, both in terms of task types, and in terms of the size of phonological units concerned. However, test validation is an ongoing process and there is still much work to be done to confirm these preliminary results.

In terms of research, we intend to conduct an external validation study to verify criterion reliability. To this end, we plan to administer our test as well as a traditional test recognized in the field by language specialists to a different group of students from the ones participating in this study. This will enable us to determine whether the results obtained in the two tests are correlated, i.e. whether the students who obtain the best results in our test are also those who obtain the best results in the traditional test. We will also be able to compare the time needed in both modes of administration, which was not possible in this study.

Furthermore, considering our research hypothesis that phonological awareness is not language-specific, we still need to compare the results on the French items and the English items (preliminary analyses not presented in this article suggest that they are highly correlated). We also plan to add items in Taiwanese. We will then be able to see whether the level of performance is the same whatever the language of the items.

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# Enhancing lexical stress accuracy in L2 Learners: A pilot study using 3D spectrogram visualization in computer-assisted language learning (CALL)

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***Abstract***

*This research tackles the ongoing challenge of perceiving and producing prosody, which is vital for the intelligibility of non-native speech. While visual aids are known to enhance speech production, there are few accessible computer-assisted language learning tools. The study introduces Englishville, a 3D spectrogram tool designed to improve lexical stress in non-native English. Six French learners participated in this pilot study. The study had three phases: a pre-test with 30 words recorded, a 10-week training session and a post-test with 60 words (including 30 from the pre-test). The study aimed to assess whether training with a real-time 3D speech spectrogram can improve lexical stress production in non-native speech. Results showed a slight improvement: all participants improved the number of correctly stressed words with the global average increasing from 65% in the pre-test to 72.78% in the post-test. Examining the results in more detail, words containing two syllables, or four syllables were more correctly pronounced in both pre-test and post-test compared with three syllable words. Despite the small number of participants, findings suggest that real-time 3D spectrogram visualization can aid in improving word stress accuracy.*

***Keywords:*** *prosody; L2 learners of English; visualising speech; CALL.*

## 1. Introduction

Research on second language acquisition has significantly increased, yet few studies focus on prosodic aspects of non-native speech and even fewer use computer assisted methods in the attempt to help learners improve. However, research has shown that prosody is crucial for intelligibility and comprehensibility (Munro & Derwing, 1995, 1998), but it has also shown that mastering features like lexical stress is challenging for learners. Nevertheless, raising awareness and providing tools to help improve lexical stress and prosody seems fundamental. For example, learners must be aware that 90% of all content words in spoken English begin with a stressed syllable (Cutler & Carter, 1987). French L2 learners struggle with English lexical stress due to significant prosodic differences between the languages. For instance, French lengthens final syllables, while English reduces unstressed syllables, often to a schwa, which causes pronunciation difficulties for French speakers. French is a syllable-timed language whereas English is stressed-timed (Frost, 2009). Misplaced lexical stress in English can affect comprehension and mispronunciations can impact intelligibility. French learners of English appear to experience significant difficulties with both the perception and production of lexical stress, to the extent that Dupoux et al. (2008) have introduced the concept of 'stress deafness'. This implies that the lack of lexical stress variation in

 

French can lead to perceptual and production difficulties when learning languages that have stress variation (c.f. Altmann 2006 for further discussion).

Major advances in speech technology have led to the increasing use of language software and technology such as computer assisted language learning (CALL), and computer assisted pronunciation training (CAPT). However, most studies that have used computer-assisted language learning tools have focused on segmental production or perception rather than suprasegmental features. In a review of 26 selected articles from the period of 2010 – 2021, only two focused solely on suprasegmental features compared with thirteen focusing on segmental features of pronunciation (Cengiz, 2023).

### 1.1 Computer assisted language learning and L2 speech research

Studies that have used CALL and CAPT methods have shown that it often leads to positive lasting effects in L2 production. This has been observed, for example in a study by Wang & Munro (2004) where sixteen native Mandarin and Cantonese speakers underwent two months of training on three English vowel contrasts. The training materials included both synthetic and natural utterances, presented progressively. Compared to an untrained control group, the trainees demonstrated enhanced perceptual performance, successfully transferred their knowledge to new contexts, and retained their improvements three months post-training.

Visualizing speech has mainly been used to work on segmental features. This includes ultrasound images of articulation, electropalatography, and feedback on acoustic measurements such as F1 and F2. Using multi-sensorial CALL/CAPT tools such as voice onset time (VOT) feedback, generally yields positive results for segmentals and can improve spontaneous speech (c.f. Kartushina, et al., 2015, for a detailed discussion). One example of a study which focused on visual feedback to help improve L2 learners' production of VOT was conducted by Offerman, & Olson, (2016). In their study, the group who received visual feedback were not only able to improve their VOT during the training but also their continuous and spontaneous speech. Garcia et al. (2018) have developed a user-friendly tool where L2 students can compare their segmental spectrographic representations with those of native and non-native speakers. These representations also appear instantaneously. They report positive feedback from the students claiming that seeing their pronunciation allowed them to improve.

The first studies that focused on prosody perception and production were carried out as early as the 1970s (James, 1976) and in 1983, de Bot (1983) demonstrated that visual feedback, i.e., when learners saw the pitch contour, was more effective than auditory feedback for improving intonation. Since then, various software enabling visualisation has been developed and used for prosody studies. Some examples include Visi-pitch (1975), Speech Viewer (1985), WinPitch (Martin, 1996), and Praat (Boersma & Weenink, 2001) (see Chafcouloff, 2004, for more details). These developments have boosted the use of language software, particularly in the domain of CALL and CAPT. The tools available on the Speech and Hearing website created by Mark Huckvale, although not specifically intended for L2 learners could also be used to practice and improve their prosody by visualizing their intonation patterns. For example, WASP 2 which shows the waveform, spectrogram and pitch, Ampitch which displays pitch and amplitude in real-time, and RETONE which enables pitch manipulation.

Some recent research has also used pitch visualizers (Chun, 1998; Gorjian et al., 2013; Hardison, 2004; Olson, 2014; Olson, 2022. Imber et al., 2017; Setter et al., 2010). For example, Gorjian et al. (2013) compared traditional repetition-based methods with the use of Praat software to teach English prosody to Iranian EFL learners. The results indicated that students who used Praat showed significant improvements in their prosodic features, such as intonation and stress patterns, compared to those who were taught using traditional methods. The study found that multimedia tools engaged students more actively, potentially enhancing motivation and pronunciation by making them more active in their learning. However, certain software requires practice and training to use which can be a barrier for student engagement (Setter & Jenkins, 2005). We believe that real-time displays are the most effective for learners due to their instantaneousness, making displays of speech less abstract.

 

### 1.2 *Englishville:* a multisensorial tool for L2 prosody training and previous studies

Several premises are behind the creation of a 3D real-time spectrogram which is now called "*Englishville*" (Edensor-Costille, 2020). First, there is a lack of free, user-friendly and easily accessible tools, that put learners in control of their acquisition and training of prosodic aspects of speech and can be used for experiments. Secondly, French learners of English struggle with suprasegmental aspects of the English language because the two prosodic systems are very different (Frost, 2009) to the point that it has been suggested that they are 'stress deaf' (Dupoux et al., 2008). *Englishville* uses a spectrogram as its foundational tool, enabling the capture of audio streams which can then be recorded on a server. The spectrogram is a visual representation of the spectrum of frequencies in a sound signal as they vary in time. It is three-dimensional, the x-axis represents time, the y-axis represents frequency, and the amplitude or intensity of the frequencies are represented in colour. This technology is integrated into a website where it is possible to record corpora and devise experiments. The spectrograms are generated in real-time allowing learners to see the model's prosody as well as their own as they speak. Audio recordings were initially saved in an Ogg format to optimize bandwidth usage while maintaining a high bit rate suitable for reuse in other software applications. In the 3D spectrogram, the harmonics, which are also visible, correspond to the multiples of the fundamental frequency.

When the human voice produces a sound, it generates a complex waveform composed of a fundamental frequency (the lowest frequency) and its harmonics and these appear visually in real-time. This means that the learners see the pitch contour and the intensity from both the model and their own production as they speak. Therefore, two spectrograms are visible, and the learners can compare their production of each word with the model. The colour spectrum, which ranges from red to blue (red, orange, yellow, green, blue) depending on speech intensity, was devised to improve the clarity of the activity by making it easier to match the colours to syllables or words. *Englishville* enables L2 learners to see and hear utterances, repeat, record and visualize both productions. The web-based platform also provides a controlled learning environment, where researchers and educators can determine what the learner sees and hears, the number of repetitions allowed (among other functions), with the objective of ensuring that experiments are easily comparable. The training sessions are listed as *drills* on the webpage and have recently been added so that learners can visually and auditory compare their own production to the model with the aim that this acts as feedback, indicating where to improve. Whilst using the drills, they can repeat utterances as many times as they want and attempt to improve with each new production by comparing and trying to match their spectrogram with the model. This can be done by comparing both the spectrograms' colours, and the intonation pattern.

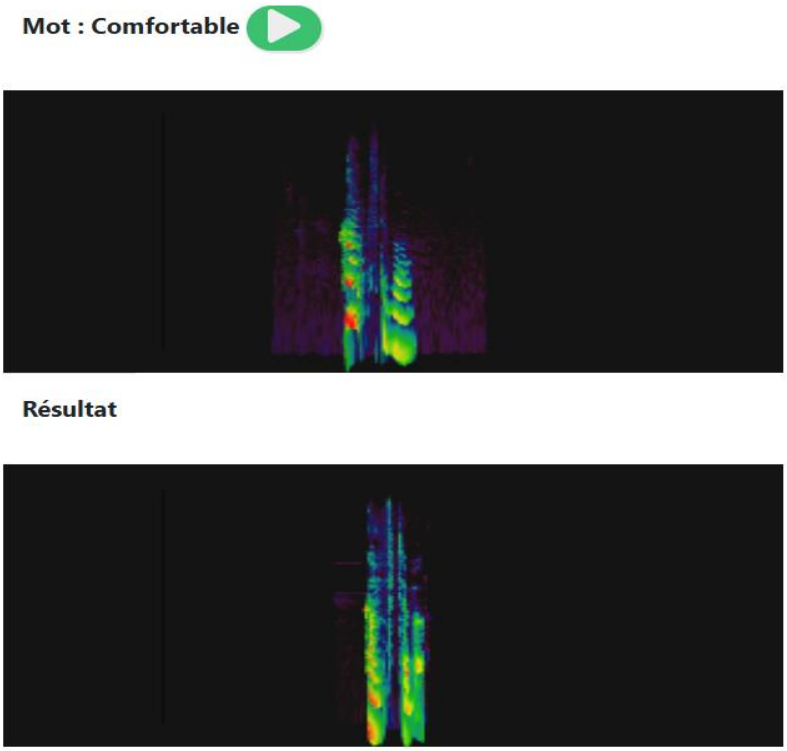


Figure 1. An example of the model (top frame) and the learners' production (bottom frame) in *Englishville* for the word "comfortable."

Figure 1 highlights the use of different colours in the model's production (top frame), with the stressed syllable appearing in red at the beginning of the word and the rest of the word appearing mostly in yellow and green. The use of a falling intonation pattern is also visible in the top frame. Underneath the model is the learner's production of the same word. This learner has correctly stressed the first syllable (also in red), but the second syllable is probably insufficiently weak judging by the amount of red in it. Additionally, the intonation pattern in this production is not as clear as in the model.

In a previous study on intonation (Edensor-Costille, 2023), four groups were given different types of input using the multi-sensorial tool described above. The first group had no input and simply read and recorded sentences. The second group listened to a model before recording their productions. The third group only viewed the spectrogram (colours and pitch contour), while the fourth group received multi-sensorial input, both hearing and seeing the model's spectrogram. Before the experiment, the learners were informed that red corresponded to stressed syllables and words and blue and green corresponded to the unstressed or weak syllables. They were informed that the aim was to try to reproduce the same colours and pitch direction as seen in the model (for group 3 and 4 only). The results showed minimal difference between the group who only received auditory input and the group who received both visual and auditory input (63.5% audio vs 64.5% visual and audio input). Several explanations were suggested for this outcome, including the French stress deafness hypothesis and the high cognitive load associated with multi-sensorial input. Other limitations included the small number of participants (eight) and the learners' input volume. Several improvements to *Englishville* were made after this experiment, notably the addition of a button to test and ensure that the participants' volume is at a certain level before participating in an experiment.

The aim of this study is to contribute new methods and tools that focus on prosody, particularly lexical stress, to the current research that uses CALL and CAPT. Previous studies using other tools have shown that combining auditory and visual input can yield better results in prosody training. Can this finding be extended to *Englishville*? Is there a noticeable difference in the participants' pronunciation of words included in the pre-test and drills

 

compared to 'new' words they had not previously trained on? Additionally, does the structure of the corpus - comprising 2, 3, and 4-syllable words - affect the results? In other words, as it seems reasonable to assume that the greater the number of syllables in a word, the more variation there can be in lexical stress patterns. Does this lead to greater misplacement of stress in longer words compared to shorter ones? Furthermore, given that French is a syllable-timed language, French learners of English may tend to pronounce too many syllables, as the language offers little opportunity for reduction or elision. Therefore, the number of syllables in participants' recordings was also analysed to examine whether this tendency influenced their pronunciation.

## 2. Method

### Context and participants

For this pilot study the focus was on lexical stress. Six B2-level French learners in their first year of a BA in English at the university of Caen Normandy voluntarily participated in this three-phase experiment comprised of a pre-test, a training period and a post-test. The students all signed a consent form granting permission for their data to be used for research and provided a statement confirming they would complete the drills weekly (for a minimum of 15 minutes each week). Their results were anonymised before being analysed. For the first phase – the pre-test was comprised of thirty words of 2, 3 and 4-syllables which had been selected for the participants to read and record. The thirty words had been selected according to the number of syllables in each word. In the pre-test, there were ten 2-syllables words, eleven 3-syllables words and nine 4-syllables. Most of these words were cognates as it was thought that they would be the most difficult to pronounce due to the influence from the L1 and would therefore better reflect the usefulness of training.

Upon completion of the pre-test, the participants were asked to complete a 10-week training session which consisted in weekly drills on words and sentences with varied lexical stress patterns. 120 words (including the 30 words from the pre-test) and 40 sentences were included in the drills. During the drill sessions, the participants had access to the visual and auditory input of both the model and their own productions. In this respect, learners were able to use their visual and aural senses to guide them towards an improved version of their utterance. During this training period, learners saw and heard a model spectrogram and audio then visualised and recorded their own. They could then listen back and visualize both spectrograms and record theirs again if necessary. They could repeat each item as many times as they needed before continuing to the next drill. Comparing both productions acts as feedback as the participants should be able to see and hear any differences between the two versions and then try to correct and improve theirs.

The experiment concluded with a post-test comprised of sixty words, thirty words from the pre-test and drills that were therefore considered as 'known' words and thirty 'new' words (also mainly cognates) that the participants had not seen during the study. The same criterion was used to select the new words in the post-test which contained eleven 2-syllable words, seven 3-syllable words and twelve 4-syllable plus the thirty words from the pre-test. Both tests also included sentences said with falling or rising intonation; fifteen in the pre-test and thirty in the post test. During the pre and post-test, the written form of the word appeared on the screen and the learners had no other visual and auditory support. The participants recorded their tests and participated in the drills on their personal computers or telephones. The post-test was only made available to them after 10 weeks of training with the tool. The study had a within-subject design meaning that the results from the pre-test were compared with the results from the post-test in order to examine their improvement.

The participants' pre-test and post-test productions were carefully analyzed through auditory evaluation, with particular attention given to two key aspects: the placement of lexical stress on each word and the number of syllables pronounced compared to the expected syllable count. For each word, the accuracy of stress placement was assessed to determine whether participants correctly identified and emphasized the stressed syllable as per standard English pronunciation patterns. Additionally, the total number of syllables produced was compared to the

 

target number to identify potential over-pronunciation or syllable omission, both of which are common issues among language learners, especially those from syllable-timed language backgrounds like French. This analysis provided insights not only into the learners' understanding of stress patterns but also into their ability to manage syllable reduction and elision, which are crucial for achieving native-like fluency in English. The comparison between pre-test and post-test performances allowed for a deeper understanding of how training impacted their prosodic accuracy and whether improvements were consistent across different word types and syllable structures.

## 3. Results

### 3.1 Global results

Figure 2 presents the overall results, illustrating the percentage of correctly pronounced syllable counts and accurate word stress placement for all the words in both the pre-test and post-test. It also presents the percentage of accuracy for these two elements in the post-test, distinguishing between the thirty words that appeared in the pre-test (the *known* words) and the thirty new or *unknown* words in the post-test. In terms of syllable count, 93.33% of the syllables were correctly pronounced in the pre-test. This improved slightly to 94.97% for the same words in the post-test. The newly introduced words in the post-test were the least accurately pronounced, with a correctness rate of 90%. Despite this, the results are quite similar, indicating that participants rarely added or omitted syllables throughout the study. In terms of word stress accuracy, there was a noticeable global improvement from 65% in the pre-test to 72.78% in the post-test. When comparing different word types in the post-test (between known and unknown), stress was more accurately placed on known words (75.97%) than on unknown words (70.56%). However, the percentage of accurately stressed unknown words in the post-test was still higher (70.56%) than in the initial pre-test (65%).

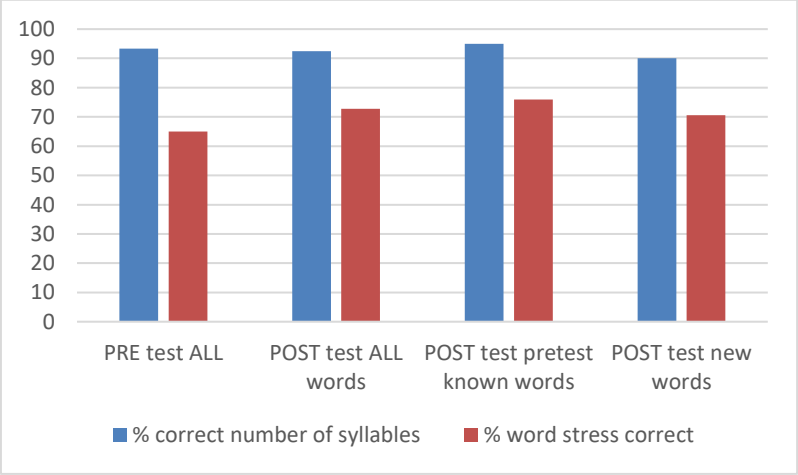


Figure 2. Global results for the correct number of syllables pronounced and the correct word stress placement in the pre-test and post-test (%).

### 3.2. Syllables in detail

The words in both the pre and post-test were chosen in terms of the number of syllables. This included words of

2, 3 and 4 syllables. Therefore, the results were analyzed based on this factor.

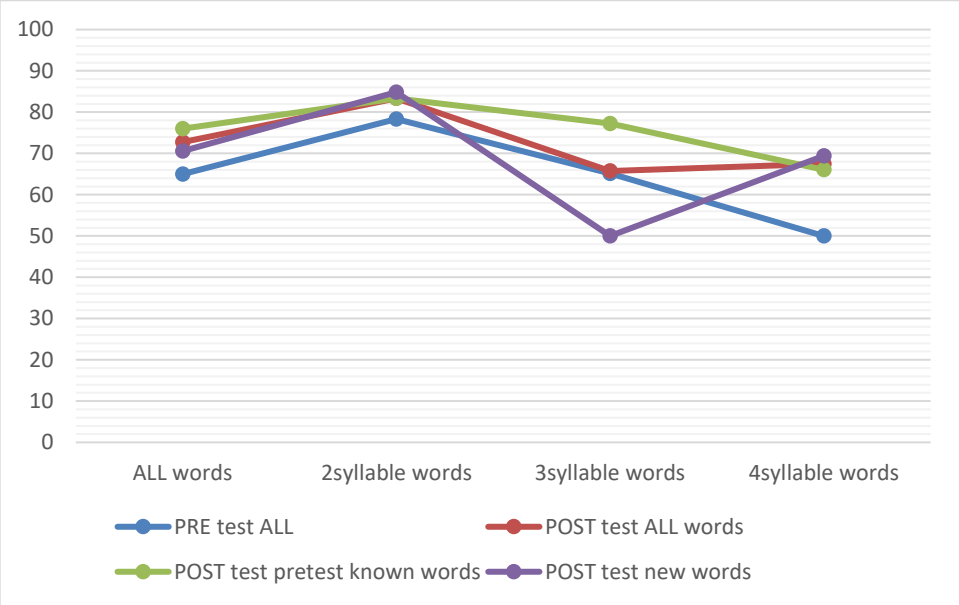


Figure 3. Results per number of syllables and the percentage of correct word stress in the pre-test and post-test (%).

As shown in Figure 3, 2-syllable words consistently had the most accurate stress placement in both tests (78.33% and 83.33% respectively). Overall, there was no significant improvement for 3-syllable words, with only a slight increase from 65.15% in the pre-test to 65.74% in the post-test. In contrast, the accuracy for known 3-syllable words improved from 65.15% to 77.27% in the post-test, whereas new 3-syllable words (in the post-test) had the lowest accuracy with the participants only correctly pronouncing 50%. For 4-syllable words, participants showed the most improvement, increasing from 50% in the pre-test to 67.46% in the post-test. However, the new 4-syllable words in the post-test had a higher accuracy (69.44%) than known words (66.04%).

## 4. Discussion

This pilot study shows that after using real-time visualization, participants' lexical stress production improved, with the average accuracy increasing from 65% in the pre-test to 72.78% in the post-test. Known words (those included in the pre-test and drills) showed greater improvement (75.97%) than unknown words (70.56%). This indicates a general improvement with new words, from 65% in the pre-test to 70.56% in the post-test, suggesting that with practice, French learners of English can enhance their accuracy in producing lexical stress. This result indicates that learners can transfer their skills and knowledge to new words, leading to more systematic and accurate processing in the post-test. This finding supports previous CALL and CAPT research which has shown that using visual aids often yields better results in training sessions when learning prosody (Chun, 1998; Gorjian et al., 2013; Hardison, 2004; Olson, 2014; Olson, 2022. Imber et al., 2017; Setter et al., 2010). The fact that participants did better in the post-test suggests that the drills had a lasting impact, and participants were more equipped to deal with the new words in the post-test than at the beginning of the experiment.

The correct pronunciation of syllables - without adding or deleting any - does not seem to be a major issue for French learners of English, as indicated by the high accuracy rate in the pre-test (93.33%). This rate only improved slightly for the known words in the post-test (94.97%). Surprisingly however, the new words in the post-test scored less than the words in the pre-test (90%). Even though the difference is small, improvement was expected in the post-test after training. This could indicate that the post-test words were generally more challenging or that the

 

training had a positive effect only on the specific words that were practiced during the drills. The words for the tests had been selected according to the number of syllables rather than according to stress patterns. This resulted in an inconsistent distribution of lexical stress between the pre-test and post-test. The stress of 2-syllable words was on the first syllable except for two words in the post-test. As for 3-syllable words, they were stressed on the first or second syllable, and 4-syllable words were stressed on the first, second, or third syllable in both tests.

The fact that the stress patterns of 2-syllable words were slightly more varied in the post-test words, meaning that they were not always stressed on the first syllable could have induced an added difficulty. However, the results showed that the participants correctly stressed 80% of the 2-syllable words on the first syllable, increasing to 81% for the same words in the post-test and 85.18% for new words in the post-test. It remains unclear whether this improvement is due to the reduced variation in stress patterns – with only two words being stressed on the second syllable or a direct result of the training. The results show that 3-syllable words were the most challenging in this study as overall improvement was minimal, with scores marginally increasing from 65.15% in the pre-test to 65.74% in the post-test. However, a deeper examination reveals an increase for known 3-syllable words, which improved to 77.27%. This contrast indicates that training had a positive impact on words that participants had specifically practiced during training. Conversely, new 3-syllable words in the post-test were the least accurately stressed at 50%, reflecting the difficulty participants faced with unpractised words of this length.

The correct stress patterns of the 4-syllable words were either on the first, second, or third syllable but despite this variation in stress placement, which could have led to lower accuracy, the participants showed the most substantial improvement, and accuracy increased from 50% in the pre-test to 67.46% in the post-test. Interestingly, the accuracy for new 4-syllable words in the post-test (69.44%) was higher than for known words (66.04%). This counterintuitive finding suggests that participants were not only able to apply their training to practiced words but also to transfer their knowledge to new, unpractised words, resulting in enhanced performance.

The variability in stress patterns across different syllable lengths appears to have influenced the results. For 2-syllable words, stress placement was mostly on the first syllable which probably contributed to the higher accuracy rates. In contrast, 3-syllable words showed stress on either the first or second syllable, and 4-syllable words had stress distributed among the first three syllables. The greater variability in stress placement for longer words was expected to lead to lower accuracy; however, the improvement in 4-syllable word accuracy indicates that participants were able to overcome this complexity effectively post-training.

The ability of participants to improve their pronunciation of the new words that were not included in the drills highlights the effectiveness of training. This transfer of skills suggests that the training provided a strong framework for recognizing and applying correct lexical stress patterns, leading to more automatic and improved processing in the post-test. This finding supports the notion proposed by previous research that practice can reinforce and strengthen L2 knowledge.

Several factors may have influenced the results of this study and can be seen as limitations, notably in terms of the method used for selecting words used in the tests. In hindsight, selecting words based on the number of syllables was not the best approach, as it resulted in a predominance of words stressed on the first syllable for 2-syllable words while 3 and 4-syllable words were not systematically stressed on the first syllable but sometimes on the second or third. To address this limitation, a future corpus is being developed, incorporating a larger and more varied set of words.

Another factor that has potentially impacted the results is the decision to assess mostly cognates and words that are known to be difficult for French learners of English. It was believed that this selection of particularly problematic words would better highlight the effectiveness of training with *Englishville*. However, this selection may not accurately show how French learners deal with and process word stress in general, with less difficult words. One could argue that these words, being more appropriate for advanced learners, were overly challenging for first-year undergraduates and may have influenced the study's overall findings. Another limitation is, of course,

 

the small number of participants. This was no doubt because the participants were asked to volunteer, rather than it being part of their curricular. The voluntary participation of these students may suggest that they were among the most motivated to improve, or potentially those who needed the training the least, which could account for the relatively high scores observed in the post-test. A larger scale study is currently in progress, with the aim of providing a more robust understanding of *Englishville*'s effectiveness in improving lexical stress.

## 5. Conclusion

This article presents the preliminary results of a pilot study examining whether French learners of English benefit from real-time speech visualization training in lexical stress pronunciation. The study aimed to determine whether visualizing speech improves learners' abilities to produce correct word stress and if training impacts how they deal with lexical stress patterns when confronted with new words, even for longer, more complex words. Through training, the participants improved their rate of accurate word stress production on both known and new words. While participants showed notable improvements with known words, the ability to apply learned stress patterns to new words indicates a deeper, more generalized learning effect. This suggests that with continued practice, French learners of English can achieve greater fluency and accuracy in their lexical stress production. In theory, this could contradict the stress deafness hypothesis (Dupoux et al., 2008), but additional participants are needed to confirm this trend. These results are more encouraging than those from previous research, where a slight improvement was observed descriptively, though it did not reach statistical significance (Edensor-Costille, 2023). Nonetheless, as *Englishville* is an ongoing project, further research is needed to validate and refine this tool and corpus, aiming to advocate L2 prosody training in the field of CALL and CAPT.

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# Exploiting the potentials of interactive live worksheets in French online classes in Jamaica

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***Abstract***

*The incorporation of interactive live worksheets at universities in Jamaica gained traction during the COVID-19 pandemic when educational institutions worldwide were plunged into online teaching to lessen the spread of the virus. Foreign language (L2) instructors needed to find creative and innovative ways to engage and motivate students in online settings. However, even beyond the pandemic, L2 instructors still have a responsibility to stimulate students' interest, which can be done through integrating live worksheets. Presently, only one recent study speaks to teachers' and students' perceptions of live worksheets in L2 classes in Jamaica (Madden et al., 2023). This current study hopes to broaden the literature. The authors sought to garner students' perceptions of live worksheets in online French classes. Nine undergraduate students at the University of Technology, Jamaica, who participated in a 13-week beginning-level French class, responded to a questionnaire. The qualitative approach was used to analyse the data. Major findings revealed that students perceive live worksheets to be effective in promoting recall and application of knowledge, as they enrich vocabulary and syntactic development. Live worksheets are also appreciated because of their user-friendly nature, instant feedback and appealing designs. However, the absence of a keyboard in the target language can cause problems with the responses.*

***Keywords:*** *live worksheet; French as a foreign language; higher education institution; online learning; Jamaica.*

## 1. Introduction

Globally, Higher Education Institutions (HEIs) are at an important juncture in terms of their modality of course offerings and assessments (Simmons, 2023). Due to the novel coronavirus (COVID-19), many colleges and universities underwent significant shifts, forcing them to adapt to virtual learning in an unprecedentedly rapid period. During this time, many lecturers had to explore creative and innovative ways to engage and motivate their learners in an online context (Ali & Khoza, 2023). Subsequent to the pandemic, several HEIs have started to offer their programmes in a hybrid format – that is combining traditional face-to-face learning with online learning. This format is particularly beneficial in the Jamaican context, as many students appreciate the flexibility to earn and study simultaneously, especially as tertiary-level tuition fees are not easily affordable by the average student. But whether teaching is done in-person or virtually, lecturers have a responsibility to cater to their students' learning in an interesting and engaging way without losing academic integrity. Foreign language (L2) teachers have an even greater responsibility to ensure constant interaction and engagement in their classes so that learners can have

 

fun while learning actively. Fuertes et al. (2023) cite a correlation between student engagement and academic success, noting that "engagement is a good predictor of academic performance" (p. 133). Pham (2022) echoes similar thoughts, affirming that "a high level of student engagement should be a priority because the more students are engaged, the more they learn and the more they achieve" (p.2).

Given the technological era in which we live, L2 teachers now rely more on computer/mobile/technology-assisted language learning (CALL/MALL/TALL), technology-enhanced language learning (TELL), and the utilisation of several web-based materials to foster L2 teaching and learning (Khan & Tufail, 2020; Nuraeni, 2021). Additionally, researchers and instructors in the language science discipline have incorporated new and varied forms of assessments, including Kahoot!, Quizlet, and live interactive worksheets (Le & Prabjandee, 2023; Sadeghi et al., 2023; Madden, 2022) – all of which fall under the broad concept of gamification – a promising feature of CALL/MALL, "which refers to the use of game design elements to engage learners or improve academic performance" (Luo, 2023, p. 1).

Accessible via *Liveworksheets.com, l*ive interactive worksheets are web-based educational resources that allow educators to create or select already-designed or customised ones shared by communities of teachers and pedagogical engineers worldwide. They have been used a lot across countries and disciplines, including mathematics (Roswahyuliani et al., 2024), English as a second/foreign language (Hidayah & Asari, 2022), and even at the primary school level (Pulungan et al., 2022). In L2 specifically, Ryabchikova et al. (2020) note that live worksheets are beneficial in the development of the "linguistic-cultural personality and formation of foreign language communication: activation of interaction; supporting the independence of cognitive activity; individualisation of the educational process; ensuring the practical orientation of classes; creation of conditions for the development of oral and written speech" (p.195). Notwithstanding, research is still limited in terms of their impact on L2 engagement and development. In Jamaica, documented experiences are still scarce on the use of live interactive worksheets in L2 education. An initial study conducted by Madden et al. (2023) sought to provide perceptions of students and teachers on their usage of live worksheets in online learning. Findings indicate that both students and teachers in Jamaica appreciate the inclusion of live worksheets in online L2 classes, given their positive "impact on making a class more interactive and fun, which boosts students' participation and motivation" (p. 14). The purpose of this study is to further bridge the data gap in Jamaica and more broadly in the applied linguistics domain, with the inclusion of another HEI and a separate target group. The study, which adopts a qualitative approach, is guided by the following research questions:

1. What are non-specialist L2 students' perceptions of interactive live worksheets in French online classes?
2. To what extent do interactive live worksheets help to develop students' cognitive and L2 linguistic skills?

## 2. Literature Review

Martinez and Smith (2023) and Chen and Lee (2021) explain that live worksheets are internet-based tools that convert conventional paper-based worksheets into interactive digital worksheets, which allow students to complete exercises online and obtain immediate feedback. Therefore, they enable teachers to provide instant feedback and track students' progress in real-time. They support interaction through different types of questions and automatic scoring capabilities, which enhance learning by enabling learners to receive immediate responses to their answers. These educational activities can be enriched with a variety of interactive elements including drag-and-drop tasks, multiple-choice queries, or short answer boxes for making the process more involving or personalised. The aim is also to include multimedia and interactive aspects into learning materials so as to improve learner's comprehension and recall of information. In the context of L2, there are numerous live worksheets that cover exercises in different languages that assess the different language skills at varying levels of Bloom's taxonomy.

### 2.1 Advantages of live worksheets in L2 teaching/learning

Le and Prabjandee (2023) indicate that live worksheets bring numerous benefits to both students and instructors, such as saving time on evaluating or providing feedback, giving instructors insights into learners' continuous

formative performance and progress in a timely manner, to include their strengths and weaknesses in both content area and language development (Montalvo-Balbed, 2012), which would subsequently inform didactic interventions and reduce instructors' workload. Instructors can monitor students' progress via live worksheets relatively easily, as the information collected from students' responses can highlight areas of success and struggle. This makes teaching more effective as it raises the standards in L2 learning. Students equally benefit from instant feedback. A student can see whether their answer is right or wrong immediately, which may prompt them to learn from their mistakes and correct any errors on time, where applicable. The importance of an immediate feedback loop in language learning lies in recognising quickly the mistakes made by students in grammar, vocabulary, and usage (Martínez & Smith, 2023). In addition, live worksheets promote self-directed learning. Teachers can provide self-paced activities such as interactive live worksheets, which promote independent learning. Live interactive worksheets encourage students to take ownership of their learning process (Nuraeni, 2021); thus, "it develops autonomy, but the teachers' guidance is welcome, primarily before and after an exercise" (Madden et al., 2023, p. 14). This autonomy fosters deeper understanding and retention of language skills, empowering learners to develop language proficiency independently.

Le and Prabjandee (2023) also note that live worksheets are user-friendly and environmentally friendly, and there is a great level of flexibility and accessibility, as they can be used in both online and in-person classes. Being digital means that live worksheets can be accessed from any device, as long as there is internet connection. Therefore, whether learning is remote or hybrid, learners can complete the worksheets from anywhere. In this way, the continuity of education is ensured outside traditional classrooms (Chen & Lee, 2021).

### 2.2 Limitations/challenges associated with live worksheets

Despite their many benefits for students and teachers, live worksheets still present some limitations. Le and Prabjandee (2023) indicate that live worksheets may not be an extensive assessment in that they can evaluate learners' pronunciation at a segmental level but fall short of assessing language fluency in various contexts. Madden et al. (2023) note that the absence of a foreign language keyboard may render correct answers incorrect due to missing accents or other issues due to the algorithm, which may produce faulty responses. Therefore, instructors have to be prepared for these eventualities. Another drawback concerns internet connectivity. Effective use of interactive live worksheets relies heavily on a stable internet connection and access to appropriate devices. Students without reliable technology or internet access in Jamaica or elsewhere may face barriers to participating fully in online L2 classes (Sadeghi et al., 2023).

Another drawback to live interactive worksheets is limited interpersonal interaction. Language learning. thrives on interpersonal communication and cultural immersion. Interactive live worksheets, while enhancing individual learning, may not fully replicate the immersive environment of face-to-face language classes offered by teachers (Le & Prabjandee, 2023). Consequently, instructors may consider discussing the answers collectively to have students participate and exchange ideas. Furthermore, live worksheets or technology in general could be a potential distraction. Educators recount that while multimedia elements can enhance engagement, they also have the potential to distract students if not carefully integrated into lesson plans. Maintaining focus and managing screen time are ongoing challenges in virtual learning environments (Madden, 2022).

## 3. Method

The current study was conducted in semester two of the 2023/2024 academic year with students who took the course Basic French (FREN3001), offered entirely online at the University of Technology, Jamaica, to investigate their perceptions of the integration of live interactive worksheets in L2 online French classes. The course was offered for 13 weeks (3 hours weekly), during which live worksheets were incorporated at various intervals in different lessons to evaluate students' formative learning and to keep them engaged.

The class consisted of 16 students; however, there were nine participants in this study (6F, 3M) who were between the ages of 17 and 28 years. All of them are undergraduate students from different majors – computer science (N=3), engineering (N=2), medical technology (N=1), business administration (N=1), architectural studies (N=1),

 

and nursing (N=1) – who chose the French course as an elective. Four students had prior exposure to French - three in middle school and one at primary school. The other five had no experience at all.

A Google Forms questionnaire containing both open- and closed-ended questions was given to the students to complete in week 10 to collect qualitative data and, to a lesser extent, quantitative data. Primary questions concerned students' knowledge and usage of live worksheets, the effectiveness of live worksheets in online French classes, advantages and limitations associated with live worksheets, the relationship between live worksheets and the development of French language skills, and the effect of live worksheets on students' motivation. The instructor's class observation notes also served as a data collection tool.

The qualitative research design is the primary approach employed in this study. The research design is chosen because qualitative research gathers participants' experiences, perceptions, and behaviours on a particular phenomenon. Qualitative research, at its core, asks open-ended questions whose answers are not easily translated into numbers such as 'how' and 'why' (Cleland, 2017). Given the open-ended nature of the research questions at hand, qualitative research design is often not linear in the same way quantitative design is (Cleland, 2017). Qualitative content analysis was used to analyse the data. With this approach, data are presented in words and themes, which makes it possible to draw some interpretation of the results (Bengtsson, 2016).

## 4. Results

### 4.1 Learners' perceptions of interactive live worksheets

Of all the respondents (N=9), 44.4% were familiar with live worksheets, while 55.6% had no prior experience. However, everyone had a positive perception of the worksheets in online French classes, with 55.6% noting that the worksheets are "highly effective" and 44.4% stating that they are "effective". As noted in the Table 1 below, learners provided various reasons concerning the effectiveness of the worksheets, including their ability to help them better understand the topics being taught through practice and recall activities.

**Table 1**. Excerpts of learners' declared perceptions of live worksheets in online French classes

| | |
|---|---|
| **Participant 1** | "I am able to get more practice in an exercise to better solidify the knowledge I am learning." |
| **Participant 2** | "The interactive worksheet exercise is a bit fun and challenges me to practice outside class to be successfully engaged through the session." |
| **Participant 3** | "It helps us to put in[to] practice what we've just learnt." |
| **Participant 4** | "It actually helps me to remember what I just learned just by doing the worksheet and also a better understanding." |
| **Participant 5** | "I found the worksheet to be effective because when I answer the worksheet it gives me feedback on what I did wrong or right." |
| **Participant 6** | "It's highly effective since you can practice the contents that you have learned already and the worksheet highlights incorrect answers." |
| **Participant 7** | "Basically I think it helps me to understand the topic more, especially if I don't get something." |
| **Participant 8** | "This worksheet allows me to test my knowledge gained during the lesson in real time." |
| **Participant 9** | "It helps me to get a better understanding of the language because I can actually attempt to answer the questions instead of just being lectured on the language. I find |

| | |
|---|---|
| | that doing questions and activities helps me to grasp the concepts of the language a bit better." |

Concerning the advantages, as selected by the respondents (see Figure 1), they unanimously appreciate that live worksheets provide immediate grade/feedback (100%), are real time (77.7%), and user-friendly (66.6%), while 44.4% acknowledged that they are colourful and well-designed.

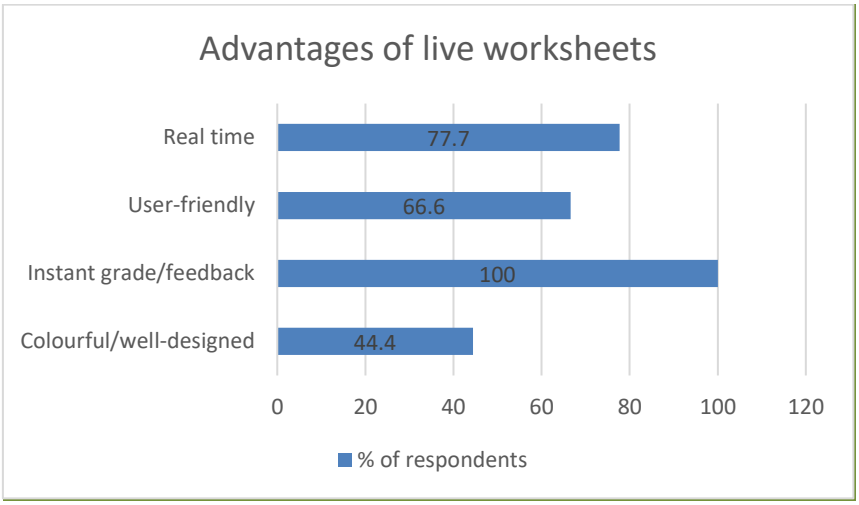


Figure 1. Learners' perceived advantages of live worksheets in online French classes

### 4.2 Cognitive benefits of live worksheets

In terms of the cognitive benefits of live worksheets on students' French learning, 88.8% indicated that the worksheets help with the recall and reinforcement of knowledge, 77.7% noted that they help with the application of knowledge, while 33.3% highlighted word-image association. Table 2 provides examples of students' self-reported impact of live worksheets on their cognitive development.

**Table 2**. Excerpts of learners' self-reported cognitive impact of live worksheets

| | |
|---|---|
| **Participant 1** | "It helps in recall as the lesson would be fresh in the mind." |
| **Participant 2** | "It helps me to recall the things I learnt to apply what I learnt in a quiz-like situation, aka the live worksheets." |
| **Participant 3** | "The activities on the live worksheets help me to grasp the concepts of the language better because I am applying the knowledge I have gained and seeing where I'm actually good and where I'm falling short." |
| **Participant 4** | "I tend to recall the information that is associated with each session and the images tend to help in matching the words when uncertain of one answers." |
| **Participant 5** | "It gives us feedback on what we do wrong and what we do right, so it extends our basic knowledge." |
| **Participant 6** | "The instant recall of whatever I learnt being utilised in the completion of the worksheet helps with memorising and learning." |

 

### 4.3 Language skill development

On a scale of 1-3, with 3 being the highest, students ranked the impact of the live worksheets on their French linguistic skills. As seen in Table 3 below, vocabulary development was ranked the highest, followed by grammar development/reinforcement, and then reading skills.

**Table 3**. Impact of live worksheets on learners' French linguistic skills

| | **Number of learner responses on a scale of 1-3** | | |
|---|---|---|---|
| **Language skill/component** | **1** | **2** | **3** |
| Vocabulary development/reinforcement | 2 | 3 | **7** |
| Grammar development/reinforcement | 3 | **4** | 1 |
| Reading skills | 4 | 2 | 1 |

The above findings are consistent with the instructor's observation notes. The instructor noted that most students experienced an improvement in vocabulary development gradually throughout the course and were able to recall and reinforce words at different intervals during the semester.

### 4.4 Live worksheets and learner motivation

All the respondents (N=9) shared a positive perception concerning the correlation between live worksheets and their motivation to learn French, noting that they make learning "fun" and "interesting" (see Table 4 below). This supports their call for live worksheets to be used in each class (N=7) or after each unit (N=2). Simultaneously, the majority of the learners (N=8) indicated that they felt "engaged/curious" when doing the live worksheets, while the remaining one (N=1) said they felt "autonomous".

**Table 4**. Correlation between live worksheets and learner motivation

| | |
|---|---|
| **Participant 1** | "I surprisingly look forward to them every class without even realizing. It makes learning a new language feel more interesting than it already is." |
| **Participant 2** | "Yes, I enjoy the live worksheets they are fun activities to do. So it's like having fun but learning at the same time." |
| **Participant 3** | "Yes, It measures where I am and then pushes me to practice to maintain or increase my grade for each exercise." |
| **Participant 4** | "Yes, the opportunity to test what I have learnt before exiting the class helps to cement what was taught as well as encourages me to do further work after class making corrections and reading." |
| **Participant 5** | "Yes it makes me recall the content easily after practicing." |
| **Participant 6** | "Yes… I get to apply what has been learnt." |

 

### 4.5 Limitations of live worksheets

With regard to the disadvantages of live worksheets, 66.7% of the respondents highlighted issues with the absence of accents or a French keyboard, 22.2% noted that some worksheets do not load immediately, while 11.1% indicated that sometimes it is difficult to navigate them. Another setback is "sometimes live worksheets incorrectly represent correct answers to be wrong and wrong answers to be correct".

## 5. Discussion

The findings, which are consistent with a study conducted by Madden et al. (2023), show that all of the respondents have a positive perception of the incorporation of live interactive worksheets in French online classes, as they found them to be effective. Learners cited different benefits of integrating live worksheets in L2 online classes, including their ability to enhance learning, by shifting from a traditional classroom to a more fun and interesting ambiance. The worksheets come in different formats and with a variety of exercises, which appeal to students' learning styles, thus helping them to be engaged and motivated to learn (Nurhidayati, 2019; Kopniak, 2018). Other notable benefits of using live worksheets are that they provide immediate grading/feedback and are user-friendly and appealing (Le & Prabjandee, 2023; Madden et al., 2023). Additionally, live worksheets present cognitive advantages (Ryabchikova et al., 2020), such as their ability to allow learners to recall and reinforce knowledge, apply new knowledge, and associate words and images. This is grounded in cognition theories, which purport that cognition refers to capacities including "memory, thinking and reasoning, special processing, problem solving, language, and perception" (Richland et al., 2006, p. 1). Furthermore, live worksheets promote vocabulary development, grammar reinforcement, and reading skills (Martínez & Smith, 2023; Wang, 2014). However, as Le and Prabjandee (2023) underscored, live worksheets are limited in evaluating certain language components such as fluency; therefore, instructors may need to find other web-based resources to help students develop certain competencies.

On the downside, as mentioned by Madden et al. (2023), the absence of accents or an appropriate keyboard (depending on the language being studied), can render a correct response otherwise incorrect. To prevent this occurrence, instructors could provide a link to a site to access the accents of the target language being studied or inform the learners on how to use the control (ctrl) function on their personal computers to obtain the accents. Notwithstanding, this may prove difficult for students who are using another device such as a smartphone to complete an exercise. Instructors need to be prepared and adaptable to different scenarios, including the algorithms producing faulting responses. Consequently, giving feedback collectively to the class is important so that misunderstandings can be clarified.

## 6. Conclusions

The study assessed L2 students' perceptions of live worksheets in online French classes and the correlation between live worksheets and the development of students' cognitive and linguistic skills. Major findings found that Jamaican students welcome the incorporation of live worksheets in L2 classes, as they are fun and interesting and help to enhance students' engagement and motivation. Students have great appreciation for the different features of live worksheets, including user-friendliness, instantaneous grade/feedback, variety of exercise types, and the appealing designs of the visuals. Additionally, live worksheets help with the development of learners' cognitive and linguistic skills, as they assist with recall and reinforcement of vocabulary and syntactic structures. However, the absence of a keyboard specific to the language being studied can cause correct answers to be incorrect. As a result, instructors have to do their due diligence before administering these worksheets and be prepared for any eventualities. Equally important is that instructors should discuss the responses collectively to ensure that there is clarity for each learner.

Although the study indicated several benefits, the authors acknowledge that the sample size is limited, which should be a caution against any generalisation of the findings. Nevertheless, it would be interesting for L2 instructors across different levels of the education system to explore the use of live worksheets with larger sample sizes and different target languages, such as Spanish and Mandarin, which are two other L2s taught in Jamaica.

 

As HEIs continue to experience a paradigm shift, L2 instruction has to maintain a deep level of creativity and innovation. Live interactive worksheets are practical pedagogical tools that can be used not only to engage and motivate students but also as a source of formative assessment for both the instructor and students to know how students are progressing.

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# Exploring potential age, gender, and first language bias when using Google Voice Typing (GVT) for automatic scoring systems in pronunciation placement tests

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***Abstract***

*Dictation technology using automatic speech recognition (ASR), such as Google Voice Typing (GVT), has shown promise in scoring pronunciation placement tests, with strong correlations to human rater scores. However, potential biases in these systems must be investigated to ensure fair and accurate assessments. This quantitative study examined gender, first language (L1), and age biases in GVT-based scoring of a pronunciation placement test. Existing recordings of pronunciation placement tests of 1000 university-level English second language students in Canada were examined. The test takers completed a timed task of reading five increasingly complex sentences which were scored by human raters. Regression analyses were conducted with the GVT scores predicting human-rater scores, with age, gender, and L1 input as moderators. Results revealed no significant gender or L1 bias; however, test takers aged 29 and younger were disadvantaged due to an age bias. We conclude that GVT could serve as a reliable tool for scoring pronunciation placement tests if scores are adjusted to mitigate the identified age bias.*

***Keywords:*** *automated evaluation; automatic speech recognition (ASR); ESL pronunciation evaluation; Google Voice Typing (GVT); placement test bias.*

## 1. Introduction

Pronunciation plays a significant role in university placement tests for second and foreign language learners as it directly impacts their ability to communicate effectively in an academic environment. Many university placement tests include a speaking component where pronunciation is explicitly evaluated or have a pronunciation element where it is evaluated unto itself. It is important to note that second language placement tests with a speaking or pronunciation component require scoring by human raters, which can be both time-consuming and expensive (Saito et al., 2016). Human raters must apply detailed scoring rubrics to each response, which requires significant time and effort, particularly for subjective aspects like oral and written performances (Coombe et al., 2020). The need for multiple raters to ensure fairness and accuracy further increases the time and cost involved. Additionally, institutions often incur expenses related to training and compensating qualified raters. The manual nature of the evaluation also opens up the potential for inconsistencies and errors, which may necessitate additional oversight and possibly re-assessments. In addition, human raters may exhibit bias when scoring second language tests, particularly if they are familiar with the candidates' first language (L1; Carey et al., 2011). This familiarity can

 

unconsciously influence their perceptions of language proficiency, leading to biased evaluations (Saito et al., 2016). For example, raters might be more tolerant with errors made by speakers of their own L1 or overemphasize the influence of an accent. Additionally, they might misinterpret errors as being more severe or less significant based on their own linguistic background. Such biases can compromise the fairness and consistency of assessments, affecting the accuracy of test scores.

Automatic Speech Recognition (ASR) technology offers a promising solution for scoring pronunciation on language placement tests (Isaacs, 2018). Unlike human raters, ASR tools provide consistent and standardized assessments, minimizing the risk of biases and subjective judgments. This technology can process large volumes of data quickly, making it more efficient and cost-effective than traditional methods. In fact, free dictation ASR systems such as Google Voice Typing (GVT) and Microsoft Transcribe (MS-T) have been shown to score pronunciation results that correlate strongly with human raters (Johnson et al., 2024; Nelson & Cardoso, 2024). Nonetheless, ASR systems may still exhibit various forms of bias, including gender, L1, and age biases. Gender bias occurs when these systems are more accurate, for example, for male voices compared to female voices, often due to training data imbalances, leading to potential inaccuracies and unfair scoring for female users (Feng et al., 2024; Ngueajio & Washington, 2022). L1 bias arises when ASR systems are better trained on specific phonetic patterns and accents, resulting in more accurate recognition for some first languages over others; this can disadvantage speakers of less represented languages by incorrectly assessing their proficiency (Wang et al., 2018). Additionally, age bias is observed when ASR systems struggle with the voices of different age groups, providing inconsistent or lower intelligibility rates for these age groups, thus skewing the assessment results and potentially misrepresenting their language abilities (Fuckner et al., 2023). In fact, Sawalha and Abu Shariah (2013) showed that ASR showed inconsistencies for those thirty years old and above. As such, this study endeavoured see if scores generated by GVT are influenced by bias, as this would have implications for post-secondary institutions that wish to use the technology for placement tests. In order to determine this, we propose the following research questions:

To what extent is the relationship between human-rater scores and dictation ASR scores (GVT) moderated by:

1. Gender (RQ1)?
2. L1 (RQ2)?
3. Age (RQ3)?

## 2. Method

### 2.1 Context and participants

This quantitative study was conducted using existing digital recordings of university-level English second language (ESL) students during the pronunciation component of a larger placement test. The recordings had been previously scored by two experienced ESL teachers. Participants ($N$ = 1000) were university students at a French-medium university in Canada and represented five L1 groups: French ($n$ = 208), Spanish ($n$ = 207), Arabic ($n$ = 206), Persian ($n$ = 200), and Chinese ($n$ = 179). The average age was 32.47 ($SD$ = 8.73), with 467 male participants and 533 female participants. The proficiency levels of the participants ranged from A1 to C2 according to the Common European Framework for Languages (CEFR).

### 2.2 Materials

The placement test evaluated different linguistic competencies including pronunciation, which was comprised of five read aloud sentences that increased in phonological and lexical complexity. Two human raters collaborated to provide a score for each of the participants. The raters used a rubric that assessed *comprehensibility*, *phonemes*, *connected speech phenomena*, *word stress and rhythm*, and *thought groups, prominence, and intonation*. The resulting score was out of 25, which was then multiplied by four, for a final score out of 100.

 

### 2.3 Procedure

The recordings were played into Google Voice Typing in Google Docs. The resulting transcriptions were analyzed by a script that compared the ASR output to the sentence provided to the participants. The script gave points to the GVT transcriptions following the procedure established in Johnson et al. (2024), with one point being given to an accurate word (contracted and extended forms, compound nouns written as two separate words, and homophones were considered to be accurate) and half a point given to a word with an added or a missing inflection, to a compound noun that was only partially correct, and to infinitive verbs that should have been irregular past tense verbs. The number of accurate words for the five sentences was divided by the total number of words in the sentences and multiplied by 100 for the intelligibility rate. Interrater reliability for the script was determined through a comparison with rates calculated by a human rater for transcriptions of 150 participants. A two-way mixed-effect model intraclass correlation coefficient test (ICC) with absolute agreement showed strong reliability, ICC = .99, (95% CI, .980, .991).

### 2.4 Data analysis

The human-rater score, GVT intelligibility score, and the codes for gender, L1, and age (30 years and above and 29 years and below) were entered in SPSS28. A moderated multiple regression was run for each of the moderating variables (i.e., gender, L1, and age), for a total of three analyses. The human-rater score was the dependent variable, and the intelligibility score was the independent variable. Dummy codes of 0 were set up for males for the gender moderator, for French for the L1 moderator, and for ≥30 for the age moderator. Assumptions were verified before each of the analyses. Outliers, leverage points, and influential cases were found before each analysis and were subsequently removed from the dataset for that analysis. The moderation regression was run using the PROCESS macro in SPSS (Hayes, 2022).

## 3. Results

Descriptive statistics can be found in Table 1 and the statistics for the three regression analyses can be found in Table 2. The first research question (RQ1) examined whether gender moderates the relationship between the human-rater and GVT scores. The interaction between gender and the GVT scores was not significant ($b$ = .01, $SE$ = .03, 0, $t$ = -1.52, $p$ = .603). This indicates that the relationship between human-rater scores and GVT scores does not differ significantly between male and female test takers. The second research question (RQ2) pertained to the moderating effect of L1 on the relationship between human-rater and GVT scores. No significant interactions were found between any of the L1 categories and the GVT scores, indicating that the relationship between human-rater scores and GVT scores remained consistent across the different L1 groups included in this study.

**Table 1**. Descriptive statistics.

| Moderating Variables | | | GVT | | Human | |
|---|---|---|---|---|---|---|
| | | n | M | SD | M | SD |
| Gender | Male | 449 | 82.43 | 10.67 | 51.70 | 5.95 |
| | Female | 508 | 83.22 | 10.87 | 52.17 | 6.24 |
| | Total | 957 | | | | |
| L1 | French | 199 | 83.59 | 10.78 | 54.37 | 6.47 |
| | Spanish | 199 | 81.47 | 10.29 | 51.19 | 5.87 |
| | Persian | 198 | 82.67 | 9.36 | 51.05 | 5.27 |

 

| Moderating Variables | | | GVT | | Human | |
|---|---|---|---|---|---|---|
| | Chinese | 171 | 80.01 | 13.54 | 51.26 | 6.78 |
| | Arabic | 192 | 84.62 | 9.73 | 51.96 | 5.86 |
| | Total | 959 | | | | |
| Age | ≥30 | 572 | 81.90 | 11.23 | 50.32 | 5.50 |
| | ≤29 | 397 | 85.76 | 9.78 | 54.95 | 6.75 |
| | Total | 969 | | | | |

**Table 2.** Regression analysis results by moderator.

| Moderator | Variable | *b* | 95% CI for *b* | | *SE* | *t* | *p* | $R^2$ |
|---|---|---|---|---|---|---|---|---|
| | | | LL | UL | | | | |
| Gender | Constant | 22.55 | 19.24 | 25.86 | 1.688 | 13.36 | .000** | .42 |
| | GVT | .35 | .31 | .39 | .020 | 17.42 | .000** | |
| | Female*GVT | .01 | -.04 | .07 | .030 | .520 | .603 | |
| L1 | Constant | 21.77 | 16.58 | 29.97 | 2.645 | 8.23 | .000** | .43 |
| | GVT | .38 | .32 | .44 | .031 | 12.42 | .000** | |
| | Spanish*GVT | -.04 | -.12 | .05 | .055 | -.79 | .429 | |
| | Persian*GVT | -.05 | -.14 | .04 | .047 | -1.11 | .268 | |
| | Chinese*GVT | -.01 | -.09 | .07 | .041 | -.19 | .846 | |
| | Arabic*GVT | -.05 | -.14 | .04 | 0.47 | -1.08 | .283 | |
| Age | Constant | 24.40 | 21.59 | 27.27 | 1.433 | 17.03 | .000** | .47 |
| | GVT | .32 | .29 | .35 | .018 | 18.25 | .000** | |
| | ≤29*GVT | .10 | .04 | .16 | .030 | 3.35 | .001** | |

*Note.* ** p <.01.

The third research question (RQ3) explored the effect of age on the relationship between human-rater scores and GVT scores. A positive significant interaction was found between the age group and GVT scores ($b$ = -.10, $SE$ = .030, $t$ = 3.35, $p$ = .001). This indicates that age has a moderating effect on the relationship between the human-rater and the GVT scores. Further examination of the simple slopes reveals the nature of the moderating effect (see Figure 1). The red line represents test takers aged 29 and under, while the blue line represents those 30 and over. At all levels of human-rater scores, younger test takers required higher scores from human raters to achieve equivalent GVT scores compared to older test takers. Moreover, this bias disadvantaging test takers 29 years and

younger increases as human-rater scores increase, suggesting that the moderating effect of age on GVT scores becomes more pronounced at higher proficiency levels.

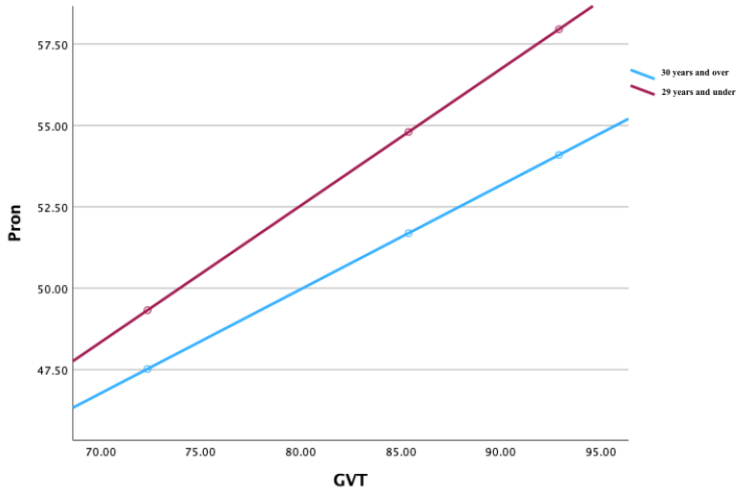


Figure 1. Simple slope analysis for age as moderator.

## 4. Discussion

The study revealed that when using Google Voice Typing, as an ASR system for assessment of pronunciation, it did not exhibit any significant bias related to the gender of the participants (RQ1). This is unlike the results found in Ngueajio and Washington (2022) and Feng et al. (2024). Bias for L1 (RQ2) did not bear itself out in our study as was found in Wang et al. (2018). This suggests that the system is capable of fairly and accurately recognizing and scoring speech from users regardless of their native language or gender. However, the study did identify a slight age bias (RQ3) that contradicted the findings of Sawalha and Abu Shariah (2013) with the system showing bias against younger participants. This indicates that while Google Voice Typing performs well for language proficiency test across diverse linguistic and gender groups, there may be room for improvement in its reliability across different age groups. Furthermore, we believe this technology can be extended to in-class pedagogical uses, assisting teachers in providing real-time feedback on students' pronunciation and helping learners improve their spoken language skills in an educational setting without concern of gender and L1 bias.

## 5. Conclusions

Based on the study's findings, Google Voice Typing demonstrates a strong potential for use in assessing second language pronunciation on placement tests. Its lack of significant L1 or gender bias indicates that it can provide fair and accurate evaluations across diverse groups of speakers. Although there was a slight age bias favouring older participants, this issue can be mitigated by taking into consideration the bias in the calculation of the score for younger users. With these improvements, Google Voice Typing could serve as a reliable and efficient tool for language placement tests, offering consistent and unbiased scoring for a wide range of test takers.

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# Promoting the learning of languages with CALL technologies

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# A multilingual and multifunctional dictionary in the service of language teaching

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***Abstract***

*The acquisition of vocabulary is a basic aim of language learning. Ordinary dictionaries are organized in alphabetical order, but in learners' mental lexicons notions are rather linked by associations. The most obvious type of association is thematic. In order to use words properly their context should be known. WordNets offer different relations to words, but they are not planned for language learning. To help the foreign language learning process, a thematic dictionary structure was worked out where the headwords are accompanied by their types, typical verbs and adjectives used with the given noun along with more specific and related concepts and expressions. The informatic system planned for use on the internet can guide the learner to different elements linked to the headword by clicking on a button, therefore they can have an overview of the semantic net of a given element of the core vocabulary which makes its use easier and faster. The dictionary system can be enlarged with new items and associated elements, new topics are also elaborated. It is multilingual (chapters in English, Esperanto, Hungarian, German, Polish, Lithuanian and Chinese are available) and new languages (such as French and Korean) can and will be added. The user can see the words in any constellation of two to three languages, not only those worked out for the traditional paper versions, therefore the language learning power is augmented.*

***Keywords:*** *data driven learning; dictionary; hierarchical structure; multilingualism; semantic relations.*

## 1. Introduction

The acquisition of vocabulary is a basic aim of language learning. How it can be facilitated with dictionaries is a basic question. Ordinary dictionaries are organized in alphabetical order which enables the quick retrieval of a given word. This is useful for translation or understanding texts. There, the words are stored separately, but in learners' mental lexicons notions are linked by associations. The most obvious type of association is thematic. That is, the words of a particular semantic field are used to describe an event. Textbooks also are organized by topics (family, work, house, traffic, etc.). There is a psycholinguistic evidence that learning words belonging to the same semantic field together can facilitate their memorization and later recall. In order to use words properly their context should be known. This includes which verbs and adjectives can be used with a given noun along with the basics of its phraseology.

To some extent, WordNets offer some relations to words, such as synonyms, meronyms, hyponyms, collocations, but they are not planned for language learning/teaching. Thematic dictionaries serve this goal. Wordnets and corpora can help the elaboration of this dictionary type (Koutny 2005). A special thematic dictionary structure was

 

elaborated for the purpose of language learning (Koutny et al. 2000, Koutny 2002, 2012). The internet implementation under construction will open a quicker and more user friendly access to the words and their contexts, also the augmentation of the dictionary will be quicker. It offers more opportunities, that is the selection of different language pairs or triplets can be considered as a particular asset. The working out of new language variants contributes to the multilingual approach to the topics. After the description of the special dictionary structure (2) and its use in teaching (3), the facilitations of the internet version (4) and its implementation will be outlined (5).

## 2. Dictionary structure

### 2.1. Alphabetical and onomasiologic dictionaries, WordNets

**Mono- or bilingual alphabetical dictionaries** list the lexemes in a conventional order to ensure easy access to them. Therefore, the relationships between the words of the same semantic field and other relations are omitted, only some of them can appear in the examples and expressions given. Knowing a word means to know the system of its semantic relations and the context, where it can be used. In the case of events, the participants would be needed and also the circumstances would be welcome, e.g. ***learn***: who learns and what; teach: who teaches what to whom. Some adverbs also would be useful for learn: *at a slow pace, easily, hard, persistently, superficially, thoroughly, by heart* or *at school, in a course, to be a doctor*, etc., but this information is not usually present.

**Onomasiologic dictionaries (thesauri)** start from the concept and assign words to it (cp. Marello 1989, Reichmann 1989). Often synonyms, sometimes antonyms, are linked to the words in these dictionaries (see the basic Rogets's Dictionary). Hyponyms and hypernyms have an important role in the thesauri where terms of different scientific and technic fields are presented.

**WordNets** – a lexical database in the internet – contains the vocabulary with its semantic relations (synonyms, meronyms, hypernyms and hyponyms, antonyms, collocations) for the different meanings of the words which are retrievable. The complete information about the word is too much in the learning process where the concrete information for the given situation is more useful. They can give useful information during working out a dictionary, as well as big corpora of the given languages (as presented also in Koutny 2005).

### 2.2. Thematic dictionaries and the SET (Systematic Esperanto Thematic dictionary)

Thematic dictionaries collect everyday words into thematic groups and subgroups; they are intended for language learners. Alphabetical order is mainly used within the thematic groups. Sometimes, some related words are located under the main words but there is no deeper lexicographic elaboration or conceptual grouping. They better help language learners than alphabetical dictionaries (cp. Stark 2011). Bilingual Polish dictionaries are popular, such as the *Harald's dictionary* (with English–Polish, French–Polish, and German–Polish versions); for Hungarian, the thematic dictionary *Öné a szó* (Emericzy 1997) is available in Hungarian–German and Hungarian–Anglo–American versions.

To help the foreign language learning process, the first author worked out a thematic dictionary structure where the headwords are accompanied by typical verbs and adjectives used with the given noun along with some related concepts and expressions (Koutny et al 2000, Koutny 2002, 2003, 2012, 2024). For verbs, some nouns, adverbs and expressions are available. Furthermore, the words are linked to their subordinate and superordinate notions (hyponyms and hypernyms), and in relevant cases also to its parts.

In the case of *chair*, the dictionary gives access to *furniture* (superordinate) and to *armchair, swivel chair, rocking chair,* and *pouffe* (subordinates / types), as well as to its component parts, such as *seat, chair leg, armrest,* and *backrest*. The verbs *to sit, sit down, stand up, to rock on the chair* are activities related to *chair*. Still in the field of furniture, the verb *equip sg* is a headword with the types *to furnish the flat, arrange the room, fasten a picture, place, put sg swhere, lay, place, hang sg,* etc. Adverbs, such as *tastefully, in poor taste, in a modern manner,* and *cosily* are also provided, as are associated expressions, such as *equipment, decoration, design,* and *room crammed*

 

*with old furniture*. So, a lot of usage context is provided for the main entries which helps learners with the proper use of the word and with the creation of texts – basic aims in language teaching and learning.

This kind of structured thematic dictionary with Esperanto as its axis, **SET** (Strukturita Esperanta Temvortaro) is planned to cover the everyday language in different fields (from human life, housing, education, work, language, communication, trough eating, dressing to the basics of scientific vocabulary) in 33 chapters. The first 6 chapters are worked out in *English-Esperanto-Hungarian* version and published. In the other language constellation the *German-Esperanto-Polish thematic mini-dictionary on Language and Communication* appeared, and *on Education and Work* is prepared. There is also an *English-Esperanto-Lithuanian* version of *on Education and Work*.

The project is continued with the *English-Esperanto-Chinese* versions in 2024 for *Education and Work*, and *Human life and Housing* with the participation of two postgraduate and two master students in interlinguistics at Adam Mickiewicz University, in Poznań (Poland). A group of master students also experienced the use of the paper dictionaries in their teaching and learning. The Chinese context is very different from the European one which poses special challenges to the adaptation of the vocabulary. Sometimes only an explanation can be given. Other languages (French, Spanish, Korean) are planned to be added in the near future.

The international planned language **Esperanto** is used as an axis in the dictionary system, it functions as an *intercultural mapping tool* between two natural/ethnic languages that have fixed realia and cultural imprints. Its flexible structure enables translations between languages even if some institutions do not exist in an Esperanto context (e.g. there is no complete educational system, there are only some individual courses in different countries).

Another example of multilingual Esperanto dictionary is *Reta Vortaro* (on-line dictionary). This dictionary is intended only for Esperantists and not especially for language learners. The user interface of this dictionary is in Esperanto and expressions are provided with descriptions in Esperanto and translations into other languages.

### 2.3. The hierarchical microstructure of the SET dictionaries

The basic words of a given semantic field are the main entries/headwords (with close synonyms separated by comma), and their possible subgroups are (concrete examples will be given in figures 1 and 2):

**HEADWORD**

- Types
- Parts
- Verbs
- Adjectives
- Related notions

Even these words can sometimes have their subordinates (e.g. a verb its agent).

## 3. SET in the service of language learning/teaching on advanced level

To learn words and expressions and to know the connections between the words with their context help the speaking and understanding of students. The collocations are indispensable in the correct use of words. All these are part of the lexical competence. An explicit teaching of vocabulary and strategies is needed mainly at the beginning and also on advanced level (cp. Hunt & Beglar 2002). It is easier to learn words which belong to the same word family, to the same semantic field or which often occur together (collocations). Language acquisition means not only learning isolated words, but acquisition of the context of their usage. The presented thematic dictionary structure assists the lexical enrichment of the students and provides material for communicative activities.

Collection of words for a given topic (learning, human life, etc.) and preparing a mind map is an introductory task for a topic. Afterwards, it can be compared with the headwords of the topic in the thematic dictionary chapter. This is more transparent in the electronic version. **Lexical exercises** contain searches for synonyms and antonyms, trying to define a given word or expression, and the contrary, to find the word or expression for the given definition for a word which occurs in the dictionary. Tasks which awake the imagination of the pupils, such as imagine and

 

describe a comfortable chair or an ideal human being etc., are assisted by the dictionary. The electronic version can soon display the needed adjectives. Close exercises also can be prepared on the basis of the dictionary material.

For Esperanto, there is a special task due to its productive word formation system: make up words from a given stem, e.g.:

**LERN**- 'learn':

V: lerni, lernadi, lernegi, lerneti, relerni, kunlerni, ellerni, mallerni, memlerni, lernigi;

N: lernanto, lernantino, gelernantoj, ekslernanto, kunlernanto, filernanto, lernantaĉo, lernantaro, memlerninto, lernejo, lernejestro, lernejano, lernaĵo, lernilo, lernilujo, samlernejano;

A: lernebla, lernenda, lerninda, lernema, lernemulo, lerniva.

The semantically related words are often also morphologically derived from the same stem in Esperanto. In the previous examples: lern-egi 'to swot', lern-ejo 'school', mem-lerninto 'autodidacte', lern-ema 'diligent'.

**Communicative activities** contain role and drama plays which can be applied after learning of vocabulary of a given topic, e.g. for learning: a) a child wants to go play with school mates, but the mother insists on finishing home work; b) counselling by career choice (professions and circumstances are offered in the dictionary); c) group discussions (how to reform the school system; what to learn?) and d) interviews (with the education minister or with a winner of a contest) making use of the words of the given chapter. Other specific activities can be found in Koutny 2002, 2008, Koutny et al. 2024. The necessary vocabulary is more visible in the electronic version. Even with the paper version, the first author had good results with the Chinese students.

## 4. Facilities of the electronic version

According to Regina & Anitha Devi (2022) – analyzing many different systems – the computer-based vocabulary learning helps the independent work of learners, improves their attitude for vocabulary, and contributes to better retention of words. The electronic version of SET planned for use on the internet can guide the learner to different elements linked to the headword by clicking on a button. In this way, it can propose adjectives and verbs or other related notions to characterize different manifestations of the topic. Therefore, the semantic relations will be more transparent, and the words for different situations are avalaible which assists the creation of written or spoken text with the given words, and in giving ideas on how to approach the topic. This is a kind of data driven learning.

Every element in the dictionary (database) can be individually retrieved and its place among the words shown. Some chapters of the dictionary were first published in book format (Koutny et al. 2000, Koutny 2002, 2005), but the electronic format is much more flexible and convenient for the learner, e.g. different appearences of a word can be found and the learner can concentrate on the verbs or adjectives on the screen. The dictionary system can be enlarged with new items and its depth increased by adding new associated elements (an editing system will be prepared for the creators of the dictionary).

The electronic version is now being created, therefore not every language module is yet entered. Adding a new language always requires some adaptations and overcoming of specific problems (e.g. the handling of Chinese characters and Chinese culture bound elements for the last four chapters).

## 5. Informatic realization of the dictionary project

The original dictionaries have a hierarchical structure which could be adapted to the electronic dictionary. Hierarchical structures are modelled as tree graphs. Each node of this tree has assigned a type. There are four groups of node types:

1. titles – they define structure of the dictionary as chapters in original dictionaries
2. headwords
3. groups of related words – these nodes never contain words and expressions. They group subnodes of words and expressions related to the headword and are of the same category
4. words – nodes containing words related to the headword, which is in the tree above.

 

Words and expressions are stored separately from the structure tree. Each expression is stored only once for each language. Nodes and expressions (word) are linked via a bound table. Each node (except for groups of related words) can be assigned to any number of expressions in any language, and vice versa, any expression can be assigned to one or more nodes. Synonyms are treated separately. A description of meaning can be assigned to them in the future.

The dictionary now (in July 2024) contains 11542 nodes, 605 of them are headword nodes and 9559 nodes for related expressions. At present, there is a total of 30 754 expressions and words in the dictionary.

### 5.1. Technical implementation

Building of an electronic dictionary is a complex process which usually starts with a corpus (Blahuš et al. 2021, Uzokova 2021, ). Fortunately, the first steps were already done previously for the given languages (English, Esperanto, Hungarian corpora were consulted).

The current dictionary and application data are stored in the database *Postgres*. This database engine was selected because the second author already had experience with it. The application has two parts. The backend is written in pure PHP 8, it only provides dictionary data to the frontend and serves as the administration part. The frontend is written in React framework with Bootstrap library. The frontend communicates with the backend via XMLHttpRequest. The JSON format is used for data interchange.

Electronic dictionaries usually don't just store the words, other metainformation is also provided. This can be accomplished by XML-format. There is no standard XML for dictionaries. Some of them are discussed and a new one is proposed in Měchura 2024. Current implementation stores expressions as plain text only. There are plans to add some other information (e.g. language and stylistic variants) to the expressions .

### 5.2. User interface

User interface provides at the current stage only two tasks. Users can **browse through the dictionary** like a book. This mode is useful for students, when all headwords for one theme are displayed together. The next step is the visualisation of different subgroups (types, verbs, adjectives, other expressions) linked to the headword.

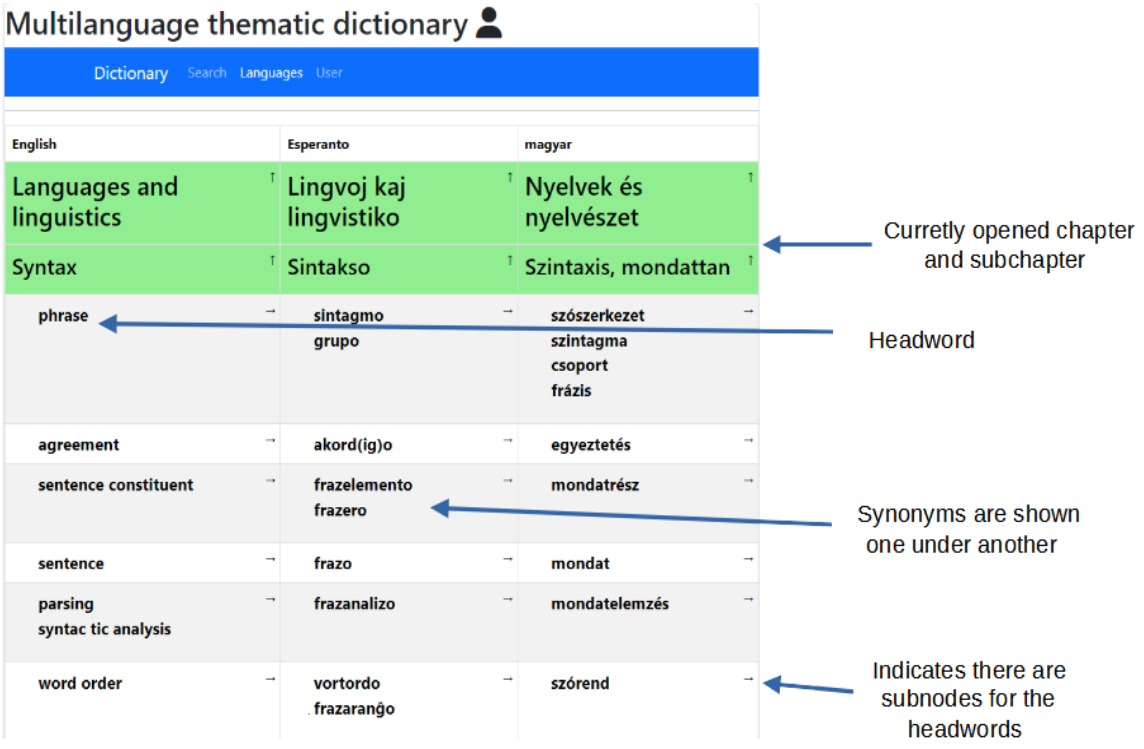


Figure 1: the dictionary item of syntax (chapter languages and linguistics)

The second mode is **searching**. The user can search for any word in the chosen language regardless of whether the expression is a title, headword, or related expression. All nodes where the expression is found are displayed. All occurrences of the searched expression are highlighted. Nodes above are also shown in order to see the expression in a context. Currently, the dictionary does not use text search capabilities of Postgres. This is due to a limitation of webhosting used in the development phase. It does not support any dictionaries to implement text searches. The SQL operator ILIKE is used instead.

The better visualization of different subgroups of a given headword is under construction. It is important to have different colours and letter sizes in order to help the students' work with the dictionary.

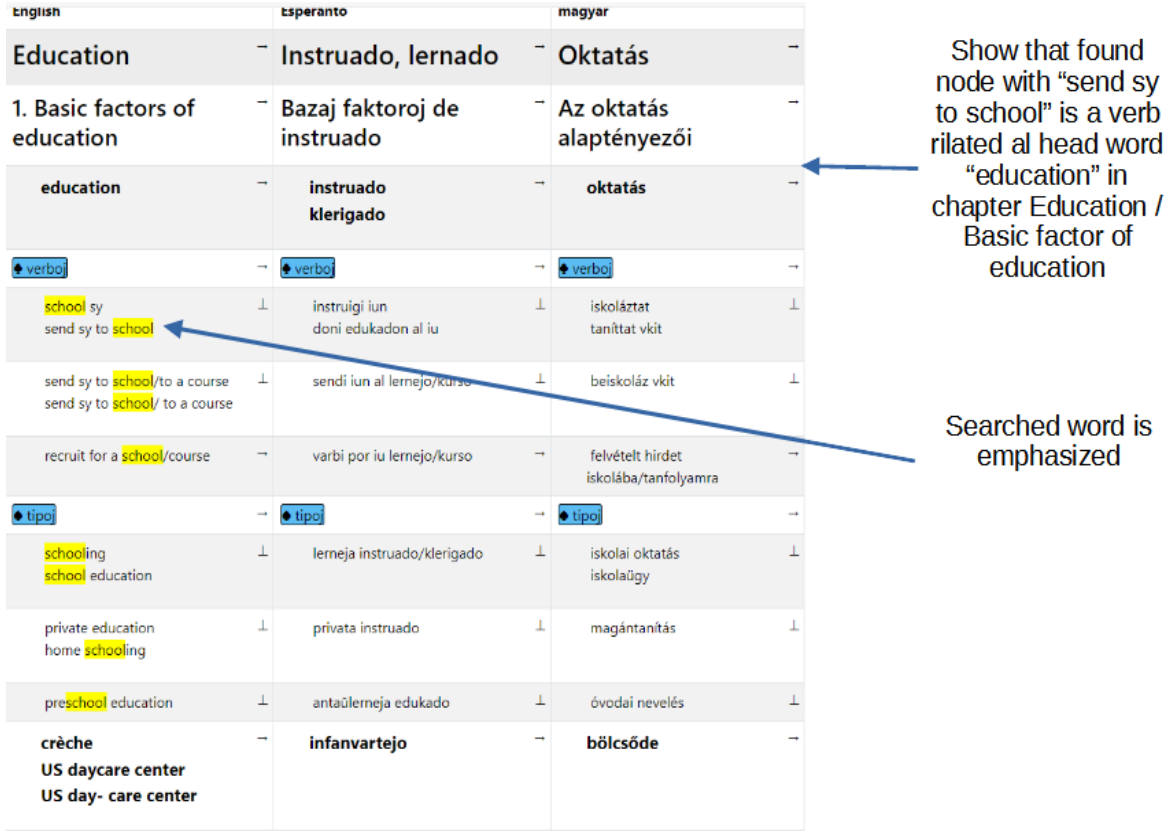


Figure 2: search result for 'school'

The dictionary is multilingual, hence expressions in any language can be assigned to any node. Now, the dictionary has content in six languages: Chinese, English, Esperanto, German, Hungarian, and Polish. The user can select up to three languages for the dictionary display. The user interface is also internationalized. Three languages are supported at this time: English, Esperanto, and Czech. Other languages can be added, and the languages of dictionaries will be added. Texts of the user interface are also stored in the database.

### 5.3. Conversion of the original dictionaries

The original paper dictionaries were written in Microsoft Word with styles for formatting and the main part was composed as a table with invisible borders. The original text documents were read by macros written in VBA. The role of expressions (title, headword, type, verb…) was detected by text styles and direct formatting. The result was written in an Excel spreadsheet with information about the structure. The data were then imported onto the database.

The imported data had to be cleaned because the original document was intended for print and not for electronic use. Hyphens had to be removed, synonyms were separated by commas, related words referred to headword by tildes. This cleaning was done partially directly in SQL, partially per scripts in PHP, and partially manually.

 

Merging the dictionaries created another problem. Different versions of the dictionary have the part in Esperanto in common. The idea was to find the same Esperanto text in the already imported dictionary and in the newly imported one and bind word from the newly imported dictionary to nodes already existing. But the expressions are not always the same due to adaptations made for the new language. This caused incorrect mergings. Manual correction and automatic corrections using SQL commands were used to repair the structure and remove duplicated expressions. Revision is still needed.

## 6. Conclusions and Prospects

The electronic version of the thematic dictionaries is more user friendly than the paper version. The associated words to the main entries or headwords (most important elements of the given thematic field) – in different groups (types, parts, verbs, adjectives, and other additional words and expressions) – can be better presented after clicking on the appropriate button. The visualisation of the groups aids in better memorisation of the elements. This function is under construction.

The selection of language pairs or triplets – not only of those in the original paper versions – is a new possibility. As an innovative solution, Esperanto is the axis between the languages. Its flexibility and less ambiguity enable the translation or the explanation of different terms, realia, and expressions, therefore this international language functions as an intercultural mapping tool.

A significant advantage of the structured dictionary system is its multilingualism. At the moment, there are chapters in English, Esperanto, Hungarian, German, Polish, Lithuanian, and Chinese, so both bigger and smaller as well as European and Asian languages are included. New languages can be added later. New elements can also be added to the vocabulary. The addition of new languages always brings the need for some kind of adaptation and new elements.

In the paper versions, lexical exercises and communicative activities are also prepared for students. These exercises are intended to show how the dictionary can be used in teaching vocabulary and communication at an advanced level. The online version helps the homework of the learner. The lexical database can drive the students to the description of the different situations and the creation of texts. The application of the (paper) dictionaries in the teaching praxis at the AMU has proven their usefulness. The electronic version will facilitate the students' homework and better retention of the vocabulary of different topics.

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# Designing, optimising and reflecting on CALL-informed technologies, pedagogies and practices: Case studies in Less Commonly Taught Languages (LCTL) and Endangered Languages (EL) contexts

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***Abstract***

*This paper outlines the design, optimization and implementation of CALL-informed technologies, pedagogies, and practices in the context of Less Commonly Taught Languages (LCTL) and Endangered Languages (EL) by exploring four specific cases globally. CALL practice in LCTL and EL contexts is initially discussed concerning the theme of CALL for humanity. An overview of the role of technology more broadly in the LCTL context in supporting the multimodal teaching of LCTLs is subsequently outlined. The case studies are then introduced. The first case study investigates a participatory approach that values student voice and agency in student engagement with CALL resources for new Japanese language learners at the primary school level. The second case study examines the use of digital game-based language learning for learners of Irish, while the third case study presents the CALL-related challenges for educators and learners of Maltese as a minority language. Finally, the fourth case study explores the linguistic status of Jamaican Creole (JC) and the potential of telecollaboration to develop learners' sociolinguistic awareness in JC. Key findings to inform CALL design, optimization and practice more generally, which are drawn from the collective case studies, are subsequently presented before concluding points that frame the LCTL/EL SIG symposium.*

***Keywords:*** *Less Commonly Taught Languages; Endangered Languages; Japanese; Irish; Maltese; Jamaican Creole.*

## 1. Introduction

CALL for Humanity presents a timely lens to explore and discuss CALL today amid global challenges such as international tensions, present conflicts, and the accelerating climate crisis. It can be argued, however, that CALL in the context of endangered languages (EL) and Less Commonly Taught Languages (LCTL) has always, by its very nature, been underpinned and guided by an ethical approach informed by humanity, inclusiveness,

 

and an enduring hope to connect EL and LCTL learners and communities of learners for the benefit of both the language and its people and learners. CALL has for many decades played a role in revitalising language engagement and human and community interactions therein.

In this symposium paper, CALL academics and practitioners explore and discuss research, practice, and its implications for technology-mediated language learning and EL and LCTL contexts. Olko and Sallabank (2021) provide a beneficial overview of revitalising endangered languages and note that the language learning aspect is one element of a wider revitalisation landscape, while Ward (2018) provides an overview of ELs and LCTLs in the CALL context. Within the label of LCTLs, there is great variation in the languages being studied, their context, and learner motivation. Mandarin and Arabic are LCTLs in some learning contexts, for example, but they have a large number of native speakers. Learners may study these languages for business or cultural (heritage) reasons. The writing systems in Mandarin and Arabic can pose specific challenges for learners. Japanese has considerably fewer native speakers than Mandarin or Arabic, for example, and is also considered an LCTL in European contexts. However, it appears to hold certain cultural capital as a language, and learners are sometimes attracted to learning the language based on their exposure to manga or some other popular aspect of Japanese culture. Japanese has three writing systems, and this can be challenging for learners, specifically for those familiar with the Latin alphabet (Rose, 2019). Irish is the official language of Ireland, but less than 2% of the population speak the language daily. Most schoolchildren study the language in school as it is a compulsory subject, but there are many adult heritage learners of the language outside of Ireland. Maltese is an official language of Malta, but it is a small language in terms of speakers. Jamaican Creole is not an official language, and the number of learners studying it formally is relatively small. While there is substantial variation across these languages, they all fall under the LCTL label.

Teachers and learners of ELs and LCTLs have to be creative and pragmatic when developing CALL resources for their language. Sometimes a reuse and repurpose strategy might work well in the LCTL context (Ward et al., 2019). In this symposium paper, CALL researchers working in different contexts with different languages will explore how they use a holistic approach to leveraging the affordances of technology to enhance the learning experience.

Firstly, an overview of the role of technology more broadly in the LCTL context is provided in order to inform the introduction of four specific LCTL CALL case studies from around the world. The first case study looks at a new initiative for learning Japanese in a primary school. It explores the value and potential of student voice as a catalyst for language learning agency when designing and implementing an LCTL CALL pilot initiative for new learners of Japanese. The second case study looks at the use of digital game-based language learning for learners of Irish and the role of the spirit of the language in the language learning process, while the third case study looks at the challenges of Maltese as a minority language. The final case study looks at the Jamaican Creole context, where it is widely spoken in society but has no official status.

## 2. Method

### 2.1 Overview: the role of technology in the Less Commonly Taught Language contexts

All languages can benefit from the use of technology in the teaching and learning process. For the most commonly taught languages, particularly English, Spanish and French, there is a wealth of CALL resources available to learners. Some resources focus on a particular aspect of language learning (e.g., reading, pronunciation, vocabulary), and learners can choose the resources that work best for them. However, in an LCTL context, this is not the case. It is perhaps not surprising that there are fewer resources, given that the languages have fewer students, but that does not imply that LCTL learners have fewer needs in terms of CALL resources. The opposite may be true. LCTL learners may need more resources than students of a more commonly taught language. These learners may have limited opportunities to learn and practise with other students. They may not be able to interact with native speakers of their target language, and CALL resources could help in this regard. Godwin-Jones (2013) outlines the contribution that CALL can make in the LCTL

 

context. This includes reading and vocabulary development, listening comprehension, and enhancing learner engagement. Winke et al. (2010) note that, paradoxically, learners of LCTL are less likely to avail of CALL resources than those of the more commonly taught languages.

CALL development is challenging, and ideally, there would be a multidisciplinary team involved in the design and development of CALL resources. However, this is not usually the case, particularly in the LCTL context. The team blend in the LCTL context is sometimes different, and CALL researchers in this context often have to be resourceful and reuse tools and resources developed for other languages (O'Toole et al., 2023). They may use generic tools and develop resources using these tools (e.g., using Quizlet to develop vocabulary resources for their specific language). CALL researchers in the LCTL context may feel more isolated than their English language colleagues and be less aware of what CALL resources they could use in their language context. There is still room to increase the CALL footprint in the LCTL context. However, at all times, it must be borne in mind that no language is less important or valuable than any other language and that learners of LCTL can benefit from CALL resources, regardless of the 'size' of the language.

### 2.2 Case study 1: Learning Japanese in a primary school setting

The second case study documents student engagement with Japanese language CALL resources to support the learning of Japanese kana by new learners of Japanese at the primary school level in Ireland. In Ireland, Japanese is considered an LCTL. The recently introduced Say Yes to Languages (SYTL) programme encourages primary schools to engage with a language other than Irish and English in an introductory module at the senior primary level. Notably, the teaching and learning of LCTLs has been encouraged and supported alongside more commonly taught languages (MCTL). In the case of Japanese, 13 primary schools currently teach it via the SYTL, which is supported by Post-Primary Languages Ireland (PPLI, 2024). SYTL offers primary schools an informative opportunity to engage with Modern Foreign Languages (MFL) teaching and learning ahead of the stipulated introduction of MFL to the primary curriculum in Ireland in 2025.

The exploratory study took place during the summer term, whereby senior primary students opted in to take part in a weekly extracurricular class after school over eight weeks. Eight students had previously been introduced to the Japanese language earlier in the school year on the SYTL initiative. A further two students had studied beginners' Japanese independently, and half of the cohort were new learners of the language who had an interest in Japanese language and culture. Thus, twenty-fifth-class students with an average age of eleven began the exploratory course, and eighteen students completed it. The language learning focus of the Japanese CALL resource engagement was the Japanese writing system. Students were introduced to a series of web-based resources and a selected number of Japanese language apps that focused on single or multiple elements of Japanese kana—Hiragana, Katakana, and introductory Kanji. The exploratory pedagogical approach encouraged student voice and student agency in terms of choosing the apps to explore, engage with, and review. Students also offered regular feedback after sessions and at specific junctures (e.g., halfway review) to ensure their perspectives informed the class content and structure. Furthermore, students were encouraged to review Japanese writing apps to share reviews and work towards group reviews of the apps utilised to inform school practice and language app procurement and engagement in the future.

All participating students indicated at the outset a tangible interest in the Japanese language and culture, in addition to several students who referenced prior awareness of aspects of the Japanese writing system. Students engaged in regular class-by-class feedback both informally and in more structured ways (shared review of end-of-class 'post-it' feedback, individual learning logs, and individual and group app reviews) to inform the structure and flow of each class. The study incorporated a participatory approach which valued student voice, whereby the teacher-researcher and students worked together and reviewed class progression and content in partnership. Students' reflections on their learning experience were overwhelmingly positive, with substantial references to fun and enjoyment, learning and engagement, which strongly suggests that some of the typical challenges faced by learners of Japanese writing, such as item overload or monotonous teaching and learning practices (Nesbitt & Müller, 2016), did not appear to arise at this early stage of engagement. Interestingly, two-thirds of learners indicated that they had engaged with the Japanese language CALL resources at home

 

independently. From the teacher-researcher's perspective, the PAR approach and emphasis on student voice and agency richly informed lesson design and a co-creation approach to learning content and structure. Furthermore, a facilitative approach to kanji engagement (Mori, 2012) through app introduction and engagement choice may have offset a potentially overwhelming experience of encountering kanji characters as a new learner. It is hoped that further collation and dissemination of students' individual and group CALL resource reviews will inform the next stage of this study.

### 2.3 Case study 2: Digital Game-Based Language Learning for Irish

Irish is a Celtic language, spoken in some communities in Ireland. It was the main language of communication over 150 years ago, but it is now a minority language in a predominantly English-speaking country. Irish plays a complex socio-cultural role in Ireland, with people valuing it as a unique part of their cultural heritage while at the same time thinking that other languages (e.g., Spanish and Mandarin) might be more useful. There is a limited commercial market for Irish CALL resources, and apart from school children and heritage learners who study the language for different reasons, this will remain the case for the foreseeable future.

There are very few CALL resources specifically for Irish students, particularly primary school students (Ward, 2020). Technology has been used for Irish in the primary school context (e.g., Ward, 2007; O'Toole & Devitt, 2022), but there has been limited uptake of these resources. It can be difficult to develop good quality CALL resources for Irish and ensure that they are curriculum-aligned to increase the chances that they will be used in the classroom context. O'Toole (2023) outlines an approach where the teacher is directly involved in the CALL process, while Ward et al. (2024) provide an overview of a co-creation approach with a primary school teacher. Both of these papers speak to the need to focus on the human aspect of CALL, both from a learner's perspective and a teacher's perspective.

Digital Game-Based Language Learning (DGBLL) apps can be beneficial for language learning. However, they are challenging to develop. One approach to overcoming this difficulty to some extent is to reuse and repurpose an existing DBGLL for a different context. Cipher is a DGBLL app that was initially developed for English and subsequently adapted for Irish. It asks players to find words that have been put under a magic spell by an evil character. If they find all the words on a page, they can move on to the next page until they have completed all the pages of a story. There are hints available as well as a vocabulary component that can help the players. Cipher has gone through several development iterations, and at each stage, teachers and learners have been involved in the process. A user-centred approach is important in CALL, especially when limited development resources are available.

Cipher has several aims: to provide an interesting and enjoyable app for learning Irish, to be an inclusive app for students regardless of ability, and to foster a more positive attitude towards learning Irish and to the language itself. The feedback from teachers and students is positive and indicates that there is an appetite for CALL resources for Irish (Xu et al., 2022).

### 2.4 Case study 3: Maltese

Maltese, a distinctive Semitic language influenced by Arabic, Italian, and English, faces significant challenges as a minority language, particularly in the digital age. A recent study by Żammit (2024) delves into these issues and explores the potential of Computer-Assisted Language Learning (CALL) to address them. Through interviews with 34 Maltese teachers, the study identified key obstacles, including a scarcity of digital resources, inadequate integration into educational technologies, and a lack of CALL tools specifically designed for Maltese (Żammit, 2020; Żammit, 2023). The limited number of native speakers and the prevalence of English in Malta make these difficulties worse. Despite these hurdles, CALL is a crucial tool for revitalizing and preserving Maltese (Olko & Sallabank, 2021). It can offer interactive language learning apps, online courses, and digital archives, making the language more accessible and engaging. Furthermore, CALL fosters a sense of community among learners and native speakers, promoting cultural preservation and language transmission (Borg, Caruana, & Vella, 2014; Brincat, 2011). This approach supports linguistic diversity and bridges the gap between EL and LCTL learners, fostering inclusiveness and an enduring hope for the Maltese language's future (Levy & Stockwell, 2006).

 

### 2.5 Case study 4: Jamaican Creole

Although Jamaica only has one official language (English), Jamaican Creole (JC), also known variously as patois, patwah, patwa, or simply as 'Jamaican', is widely spoken across the society; however, JC does not have any official status at present (Hoyte-West, 2022). Despite being a minority language, the non-inclusion of JC in the education sector from a policy perspective poses challenges for local learners who speak English as a secondary language, as they are forced to be educated in English, a language which they continue to struggle to master (Davids, 2013). Many linguists and researchers have called for English to be taught as a second language in Jamaica or for a bilingual approach to be taken to teach English and JC simultaneously (Williams, 2019). It is an opportune time for the Jamaican Government and policy stakeholders to give appropriate recognition to JC, especially as the country has embarked on a process of becoming a republic, thus severing ties with the British Monarchy. Additionally, the United Nations Educational, Scientific, and Cultural Organisation (UNESCO) has proclaimed the period between 2022 and 2032 as the International Decade of Indigenous Languages. Therefore, JC should be given its due official status, as a language affects the citizens' identity.

There is inadequate documented literature on the potential of CALL to promote JC, but Mair (2003) discussed the role of written JC in computer-mediated communication (diasporic cyberspace) to help Jamaicans outside of the country to learn JC. Madden and Ashby (2021) noted the potential of telecollaboration to develop foreigners' sociolinguistic awareness in JC. Tucker (2020) reported on the Jamaican Creole heritage language instruction in Toronto and noted the complex and multi-layered nature of attitudes towards the language. There is a need for CALL resources for JC. The Jamaican Language Unit of the University of the West Indies, Mona, has recently started offering online classes in JC to foreigners interested in learning the local language. The Language Teaching and Research Centre (LTRC) of the University of Technology, Jamaica has also been offering an online course in JC to expose more Jamaicans to the formal structures of the language. More resources are needed to promote these courses. Other CALL resources are starting to emerge; work is underway in the development of a web-based Jamaican language dictionary, which could be of benefit to learners both inside and outside Jamaica.

## 3. Discussion

It is helpful to know what CALL resources are available for the language (Japanese case study). It is demonstrated that such ready-made resources can be optimised for the specific learning context through valuing and facilitating student review and collaboration to establish the affordances and limitations of the given CALL resource from the learner's perspective. This empowers students not only in terms of language learning, but also in terms of developing critical skills to analyse CALL resource usefulness.

The size of a language in terms of learners should not detract from the need for CALL resources for the language. Although the languages covered in this paper differ greatly in terms of the number of speakers, number of learners, official status, and availability of CALL resources, learners of Japanese, Irish, Maltese, and Jamaican Creole can all benefit from having digital resources made available to them.

Furthermore, unlike Irish, which has benefitted from the adaptation of existing CALL resources originally developed for English, Maltese lacks this cross-language resource adaptation (Ward et al., 2024). This represents a missed opportunity where existing CALL frameworks could be repurposed for Maltese language learning, as is happening in other LCTL contexts (O'Toole et al., 2023).

Maltese, a minority language with significant historical influences from Arabic, Italian, and English, faces various challenges in the digital age, particularly in the realm of CALL. Recent research by Żammit (2024) highlights these challenges, pointing to the scarcity of dedicated CALL resources and limited integration of Maltese into educational technologies. In comparison to other LCTLs and Endangered Languages (EL), Maltese shares common barriers, but its context presents unique challenges, particularly due to the widespread use of English in Malta.

 

In Żammit's (2024) study, interviews with Maltese educators revealed a pronounced lack of tailored digital tools and resources to support Maltese language learning. This aligns with findings for other LCTLs, such as Irish and Jamaican Creole, which experience similar limitations due to their minority status. Irish educators, for example, face a shortage of curriculum-aligned CALL resources despite the cultural significance of the language in Ireland (Ward, 2020). The lack of Maltese-specific digital tools, compounded by the dominance of English in Malta, may further reduce the urgency for developing such resources (Żammit, 2020; Żammit, 2023).

However, Maltese differs from other LCTLs like Japanese, which benefits from commercial support due to its cultural appeal outside of Japan (Rose, 2019). This is not the case for Maltese, which lacks international recognition. Consequently, CALL resources for Maltese remain significantly limited, despite its official language status.

One notable similarity between Maltese and other LCTLs is the potential for CALL tools to foster community and cultural preservation. Borg, Caruana, and Vella (2014) and Brincat (2011) argue that digital archives and online platforms could enhance Maltese language accessibility. This mirrors the Irish context, where Digital Game-Based Language Learning (DGBLL) apps like Cipher have been adapted to create inclusive learning environments for minority language learners (Xu et al., 2022). The reuse of existing CALL resources, which has proven beneficial for Irish (Ward et al., 2024; O'Toole et al., 2023), remains a missed opportunity for Maltese.

Żammit's findings (2024) emphasise the importance of CALL for promoting Maltese, but the human-centred aspect of CALL development is crucial, as noted by Olko and Sallabank (2021). CALL tools not only facilitate language learning but also build a sense of community among learners and native speakers, which is essential for the revitalization of ELs and LCTLs. This community-building function is critical for Maltese, as digital language learning platforms could bridge the gap between native speakers and new learners, fostering linguistic and cultural continuity (Levy & Stockwell, 2006).

It is also important to recognise that having access to CALL resources is essential for all languages, regardless of the size of their learner base. As demonstrated in the Japanese case study, ready-made resources can be optimised for specific learning contexts through student collaboration and feedback, which improves both language learning outcomes and students' ability to assess the usefulness of CALL tools. Learners of languages like Japanese, Irish, Maltese, and Jamaican Creole all stand to benefit from tailored digital tools.

Another important observation is that existing CALL resources can be reused to create resources for other languages. In the case of Japanese, existing resources were utilised with the students. In the case of Irish, an existing DGBLL was adapted to Irish. Both of these approaches made the use of CALL a much more efficient process than would have been the case if the CALL researchers had to start from scratch.

One takeaway for LCTL CALL researchers is that they should feel empowered to use existing resources (where possible) and to adapt resources if that makes sense in their context. They may be pleasantly surprised by the willingness of CALL researchers from 'bigger' languages to work with them on adapting their resources to a new context. It cannot hurt to ask.

## 4. Conclusion

This symposium paper set out to explore the design, implementation, and optimization of Computer-Assisted Language Learning (CALL) resources in the context of Less Commonly Taught Languages (LCTL) and Endangered Languages (EL). The motivating problem lies in the unique challenges faced by these languages in the digital age, where the lack of dedicated resources and integration into educational technologies threatens both language preservation and the learning experience. The case studies presented, including Maltese, Japanese, Irish, and Jamaican Creole, highlight the disparities in CALL resource availability and sophistication across different linguistic and educational contexts.

While the case studies outlined differ in terms of educational context, scope, levels of CALL integration, and CALL resource sophistication, it is evident that designing and implementing CALL resources and CALL-

 

informed pedagogy and practices into an EL or LCTL language learning context differs from other more commonly taught language contexts. It requires dedicated consideration of the learning context and its stakeholders, and it could be argued that the 'humanity' aspect of CALL is to the fore in EL and LCTL contexts. This symposium will reflect on these ideas and explore the nuances of language learning in EL and LCTL contexts.

The specific problem addressed in this research is the insufficient development and adaptation of CALL resources for minority languages like Maltese. Although Maltese is an official language in Malta, it suffers from a lack of digital resources tailored to its linguistic needs, further complicated by the prevalence of English as another official language in Malta. This gap is particularly stark when compared to other LCTLs like Irish, which have benefitted from the adaptation of CALL tools initially developed for more commonly taught languages like English. By focusing on this gap, this paper contributes to the understanding of how existing CALL frameworks can be repurposed for languages like Maltese, offering a potential solution to this shortage.

The significance of the results lies in the confirmation that LCTLs, regardless of their learner base size or international recognition, can greatly benefit from the reuse and adaptation of existing CALL resources. In the case of Japanese and Irish, the optimization of ready-made resources has shown to be an effective approach to enhancing language learning. Maltese, however, presents a more complex challenge, not only because of the lack of cross-language resource adaptation but also due to its unique sociolinguistic environment. The results emphasise the need for targeted efforts to address these gaps, ensuring that minority languages like Maltese are not left behind in the digital shift toward technology-mediated learning.

Future research should explore practical approaches to adapting existing CALL resources for Maltese and other minority languages. One promising avenue could be collaboration with CALL researchers working in larger language contexts, where the adaptation and reuse of resources may prove both cost-effective and efficient. Additionally, there is a need for more in-depth studies that engage directly with Maltese educators, learners, and technologists to co-create and optimise resources that are culturally and linguistically relevant.

While this paper has demonstrated the potential of CALL in revitalising and supporting LCTLs and ELs, much work remains to be done to ensure that these languages, including Maltese, can thrive in the digital age. Recommendations for future efforts include increased collaboration between researchers of both LCTLs and more commonly taught languages, the exploration of new funding models for resource development, and continued emphasis on the human-centred aspect of CALL to ensure that these tools not only serve as educational resources but also as vital components of language and cultural preservation.

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# Designing pedagogically cured interface of the CAPTinI system for practising pronunciation in L2 Icelandic

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***Abstract***

*We are presenting a methodological approach in designing a pedagogically curated user interface of the computer-assisted pronunciation training in Icelandic (CAPTinI)[1] system, an online tool for practising pronunciation in Icelandic as a second or foreign (L2) language. This online tool provides learners with examples of segmental features, e.g., vowels and consonants, in letters of the alphabet, words, phrases, and sentences, that are pre-recorded by first-language (L1) speakers of Icelandic. Learners can listen to these recordings and practise pronunciation by repeating out loud. With the recording functionality, the system captures learners' utterances and provides instant feedback. Although this online tool is still in development, we focus on applying a twofold approach in its design: (a) theoretical underpinnings in pedagogy for teaching L2 Icelandic pronunciation in a traditional teaching environment, and (b) an analysis of existing online tools for training pronunciation in various languages online, to inform its design. Thus, this paper presents the process of designing the CAPTinI tool and presents the features that we found useful for learning and practicing pronunciation in L2 Icelandic online.*

***Keywords:*** *computer-assisted pronunciation training (CAPT); Icelandic L2; interface design; pedagogy.*

## 1. Introduction

Pronunciation is part of every language learning setting. Whether in a traditional classroom or an online application, learners are introduced to the target language pronunciation in a scaffolded way; they are taught to gradually understand the complexity of the phonetic system. Computer-assisted pronunciation training (CAPT) systems represent an alternative online interim space for learning pronunciation without the presence of a human tutor. Compared to traditional classroom settings, online pronunciation learning tools represent alternative learning spaces that are accessible anytime and provide input on different aspects of the language with examples, particularly, on how to pronounce certain segmental features, i.e., vowels and consonants with its various features

[1] https://captini.tullius.dev/login

 

and duration, in the letters of the alphabet, words, phrases and sentences; and suprasegmentals, i.e., stress, prosody, pitch, tone, pause, fluency to name a few. Such online tools often have a pedagogically inclined orientation respecting both the unique characteristics of the target language and the instructional principles of language learning. These tools thus represent an alternative for learning L2 pronunciation outside of the traditional classroom setting, providing learners with a flexible and individualised language learning and practice online environment (Van Moere & Suzuki, 2018; Gómez González & Lago Ferreiro, 2024). The new online tool for computer-assisted pronunciation training in Icelandic (CAPTinI)[2] represents such an online tool (Figure 1). The aim behind its development was to design a useful tool for teaching and practising pronunciation in L2 Icelandic in an online setting.

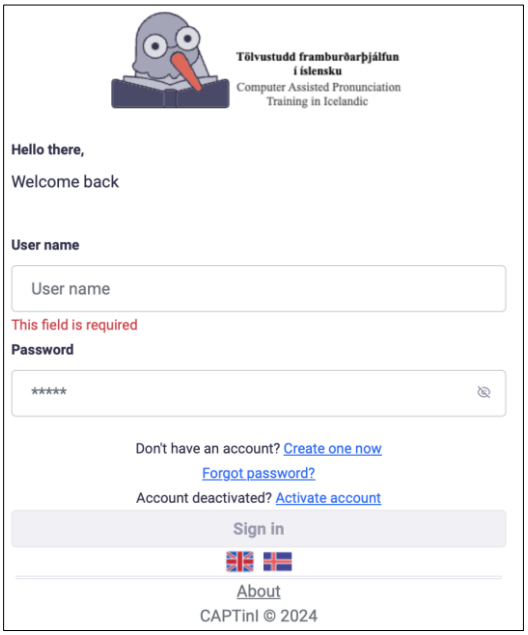


Figure 1. The landing page of CAPTinI where users can login or create a new account.

The domain of pedagogically curated interfaces for CAPT systems in Icelandic remains, however, under-explored. Apart from the CAPtinI project described in this article, there are currently no other tools that have been specifically developed for this purpose. Although there are few online tools with CAPT supported systems (Rogerson-Revell, 2021), Icelandic language remains still underrepresented in there. This paper, therefore, contributes to the CAPT research in L2 Icelandic and sheds light on those features and approaches that have been used to inform its design. By combining traditional language pedagogy with experience from experts in teaching L2 Icelandic pronunciation at university courses, along with the analysis of useful features from other state-of-the-art CAPT systems, this paper presents the process of designing the CAPTinI interface.

In the following chapter, various methods used for teaching L2 pronunciation in traditional classroom and online settings for different L2s as well as L2 Icelandic are explored and reviewed. In the next chapter, the findings from this review are summarised, thus offering a brief overview of those pedagogical approaches that have been applied in the design of the CAPTinI system. The final chapter concludes this paper by a summary and the outline of future work.

[2] https://captini.tullius.dev/about-us

 

## 2. Exploring various pedagogical methods for teaching L2 pronunciation

Many online tools and websites offer pre-recorded letters of the alphabet, words, phrases, and theoretical explanations of how to pronounce certain sounds, to provide learners with examples of spoken language they are learning or practising. Many state-of-the-art online tools for CAPT also include features of "listening to" learners speaking and providing immediate feedback on their pronunciation. Such tools include automatic speech recognition (ASR) systems and feedback functionality to support these features. Our CAPTinI system similarly uses these features but also relies on traditional classroom methods in teaching L2 Icelandic pronunciation. These features and methods will be explored in the following sections.

### 2.1. Traditional classroom methods in teaching L2 Icelandic pronunciation

Although traditional classroom methods for teaching L2 pronunciation vary from language to language and depend on both the lesson structure and course aim, which in consequence affects the materials used and the teacher's individual approach, these are nonetheless established methods of second language pedagogy and can be useful in understanding how pronunciation is trained in traditional language classrooms (Celce-Murcia et al., 1996). These understandings can then be applied to help design CAPT in online tools (Þorláksdóttir & Bédi, 2024).

Teaching pronunciation in a traditional classroom can become a very complex task. Drawing on the most commonly used approaches, teaching pronunciation can be (a) impressionistic, which is observation about sounds based on orthography and is often inaccurate; (b) intuitive-imitative, which utilises tools enabling learners to listen and imitate speech without theoretical explanation; and (c) analytic-linguistic, which complements (b) by supplying theoretical explanations and various contrastive information providing explanation and feedback about learners' production (Celce-Murcia et al., 1996, p. 2). These approaches have already influenced the development of other teaching methods such as grammar-translation method, audiolingual method, cognitive approach, the silent way, community language learning, total physical response, and communicative language approach to name a few. Focusing on the type of instruction (focus-on form vs. focus-on-meaning), the structure level (sound, word, sentence, discourse, rhythm, intonation), developing cognitive skills (noticing, reproducing, contexting, etc.), the perception and production of speech, or different other types of focus (Kirkova-Naskova, 2019) may indeed affect how an individual lessons in a classroom setting is conducted. Although teachers can interchangeably use various approaches and change the focus in teaching pronunciation depending on learners' pace and course curricula, online tools, on the other hand, do not have this flexibility. This also applies to the functionality of corrective feedback. To help build L2 learner's phonological competence, Bade and Sigurjónsdóttir (2024) suggest that it is important to pay attention to background information regarding individual learners' L1s. This is because the corrective feedback associated with learners' pronunciation problems may help the learners themselves better understand the way how certain sounds are produced in different L2s compared to their L1s. Online tools have a firmly set lesson structure with a pre-programmed focus of instruction and it is very rare, if not technologically difficult at the current stage of technology implementation, to apply such individualised approach here, as it would require fine analysis of learner data compared with access to open source large datasets of natural spoken language corpora in different languages. Despite language learning apps including more simple feedback mechanisms, these can nonetheless provide useful corrective feedback.

Compared to traditional classroom teaching, online apps include preprogrammed exercises with a relatively fixed lesson structure. This fixed lesson structure may become very useful in situations when individual learners get the possibility to return to specific lessons and re-do difficult exercises on their own pace. Such possibility may be beneficial as it supports accessibility to learning as well as individualized and autonomous learning styles.

When combining the most commonly used approaches in teaching pronunciation in the classroom settings as has been described earlier with the different methods used by online tools, one can design a well pedagogically curated online tool.

 

### 2.2. Methods used by state-of-the-art online tools with pronunciation training in different L2 languages

This section explores methods in selected CAPT systems. Based on the most recent review of language learning apps for teaching English pronunciation (Duolingo, Memrise, Babbel, Busuu, Rosetta Stone, ELSA Speak, and IELTS Speaking Practice) conducted by Coulange's (2022), we conclude that the activity type, the task design, teaching goals, available functionalities, ways of feedback delivery, and the most commonly used methods in pronunciation pedagogy (see Table 1) are the underlying features in designing pronunciation lessons in CAPTinI. In spite of its rigorous research Coulange (2022) argues that it may be hard to generalise whether CAPT systems may contribute to a significant improvement of learners' pronunciation skills. On the other hand, Robertson et al. (2018) advise that CAPT systems could create further opportunities for pronunciation practice outside of traditional classroom teaching, but learners may need to use them more often to reach a significant improvement in pronunciation. Here, corrective feedback plays a very important role. There may be different ways how to provide corrective feedback in a language learning app and the overview below provides a brief description of it.

**Table 1**. Overview of common features supporting pronunciation practice in CAPT systems.

| Feature | Description | Comment |
|---|---|---|
| **Pronunciation focus** | Activities encouraging learners to read, listen and repeat sentences, phrases, words, and individual sounds (e.g., letters). | Common in most CAPT tools; essential for practicing segmental features like vowels and consonants. |
| **Task design** | Tasks that focus on sounds of individual letters, words, phrases, and sentences for repeated practice. | Learners typically practice isolated sounds or combined in context to improve pronunciation accuracy. |
| **Teaching goal** | Combination of focus on form (pronunciation accuracy) and structure-level tasks (sentence intonation), supporting cognitive skills. | Not all tools support higher-level cognitive development, though some emphasize fluency and prosody awareness. |
| **Functionality** | Features such as audio playback, recording functionality, automated feedback (instant/delayed), phonetic transcription, and adjustable listening speeds. | Feature availability varies, with some tools offering transcription in IPA or dynamic speed control for audio. |
| **Feedback mechanisms** | Corrective feedback through colour-coding (e.g., green for correct pronunciation, red for errors), visual displays, stress highlighting, fluency scoring, and percentage-based success tracking. | Feedback can range from basic visual markers to detailed intonation and stress feedback; some tools include fluency scoring. |
| **Pedagogical approach** | Primarily intuitive-imitative, encouraging learners to imitate native-like speech, combined with some elements of analytic-linguistic pedagogy offering tips and brief theoretical explanations. | Tools that scaffold learning with explanations tend to use both intuitive-imitative and analytic-linguistic methods. |

### 2.3. Methods used in online tools with pronunciation training in L2 Icelandic

Based on a pilot study conducted by Bédi (2022), there are 36 online tools for learning L2 Icelandic. This study found that in spite of most of these tools offering listening activities, only nine focused on some kind of speaking exercises. The overview below (Table 2) presents a brief analysis of these tools, four mobile apps (also available as web apps) and one web-based course, which has been unfortunately discontinued. The method for analysis was content analysis, focusing on the presentation and utilisation of the learning material and app functionalities supporting the training of pronunciation. The results show that the impressionistic and intuitive-imitative pedagogical approaches are used here (see comparison between intuitive-imitative and analytic-linguistic in Table 1).

 

**Table 2**. Tools offering pronunciation exercises for L2 Icelandic.

| Online tool | Level | Pedagogy | Pronunciation focus | Exercise type | Tasks | Technical features | Feedback on pronunciation |
|---|---|---|---|---|---|---|---|
| *Mango Languages*[3] (app) | Beginner | Intuitive-imitative | Focus on form; sentence structure level; developing cognitive skills | Listen and read & repeat | Imitating L1-like speech; record and play-back | ASR; record and play-back; transliteration of pronunciation examples | Automatic audio-visual feedback by aligning voice pattern with given examples |
| *Opti Lingo*[4] (app) | Beginner | Impressionistic; intuitive-imitative | Focus on form; sentence structure level; developing cognitive skills | Listen and read & repeat | Imitating L1-like speech; record and play-back | Given examples in Icelandic produced by a TTS; record and play-back | Automatic feedback N/A; self-judgement of pronunciation by listening to own recording |
| *uTalk*[5] (app) | Beginner, interme-diate | Impressionistic; intuitive-imitative | Focus on form; sentence structure level; developing cognitive skills | Listen and read & repeat | Imitating L1-like speech; record and play-back | ASR not working optimally (advised by app owners); record and play-back | Automatic feedback N/A; self-judgement of pronunciation by listening to own recording |
| *Viltu læra íslensku*?[6] (web course) | Beginner, interme-diate | Impressionistic | Sentence structure level | Listen and read | Interactive assignments for practising a dialogue (no longer available) | N/A | N/A |

## 3. Pedagogical approaches applied in the design of CAPTinI

The design of pronunciation exercises in CAPTinI is based both on methods commonly used in traditional classroom L2 teaching as already described (in 2.1) and on methods commonly used in exercises for L2 pronunciation training of selected state-of-the-art online tools as already described (in 2.2 and 2.3). The content in our CAPTinI has also been developed in collaboration with *Icelandic Online*[7], which is a web-based LMOOC and contains pedagogically curated exercises in a scaffolded manner (Arnbjörnsdóttir et al., 2020), thus offering its users practising the same examples when using CAPTinI. As such, our design combines the intuitive-imitative approach, which utilises tools enabling learners to listen and imitate speech without theoretical explanation, and the analytic-linguistic pedagogy, which complements exercises with additional tips and short theoretical explanations about pronunciation.

Additionally, methods used by experts in the teaching of L2 Icelandic pronunciation in traditional classes at the University of Iceland such as including exercises for practising specific minimal pairs, consonants clusters in selected words have been applied to the CAPTinI. In doing so, the pronunciation training is divided into six topics: 1) vowels; 2) consonants; 3) more on vowels; 4) more on consonants; 5) assimilations and deletions; 6) prosody; each including 5–6 different lessons with different subtopics. For instance the Topic 1 (vowels) includes six subtopics: a) the alphabet; b) vowel letters with and without accents; c) long and short vowels; d) vowels with similar pronunciation; e) sentences; and f) word pairs including different examples of vowel combinations in words and sentences, e.g., noting the difference in pronouncing <e> compared to <i> and <í> in the words ***l*e*st** – ***l*i*st*** –

[3] https://mangolanguages.com/available-languages/

[4] https://go.optilingo.com/?

[5] https://utalk.com/en/store/icelandic

[6] http://tungumalatorg.is/viltu_laera_islensku/

[7] https://icelandiconline.com

 

*líst* and the sentence *Dísa les mikið* (Dísa reads a lot). In this way the learners can associate different vowels with different pronunciation.

The focus here is therefore on form (of individual letters and words) and the sentence structure level (phrases and sentences). The feature of developing cognitive skills is supported by providing exercises of combination of words including an extra <t> sound (Figure 3), where learners need to listen to examples, repeat and record and play back their speech output, to detect whether they performed the task successfully. The example in Figure 3 below demonstrates how a learner can listen to the example *perla – snarl* (pearl – snack) and record their pronunciation so as to imitate the sound [*pertla – snartl*] (Sequence 1), listen to their own recording to notice any difference between the example and their own recording (Sequence 2), and check their pronunciation score (Sequence 3), and then receive and review pronunciation feedback for each letter (Sequence 4)

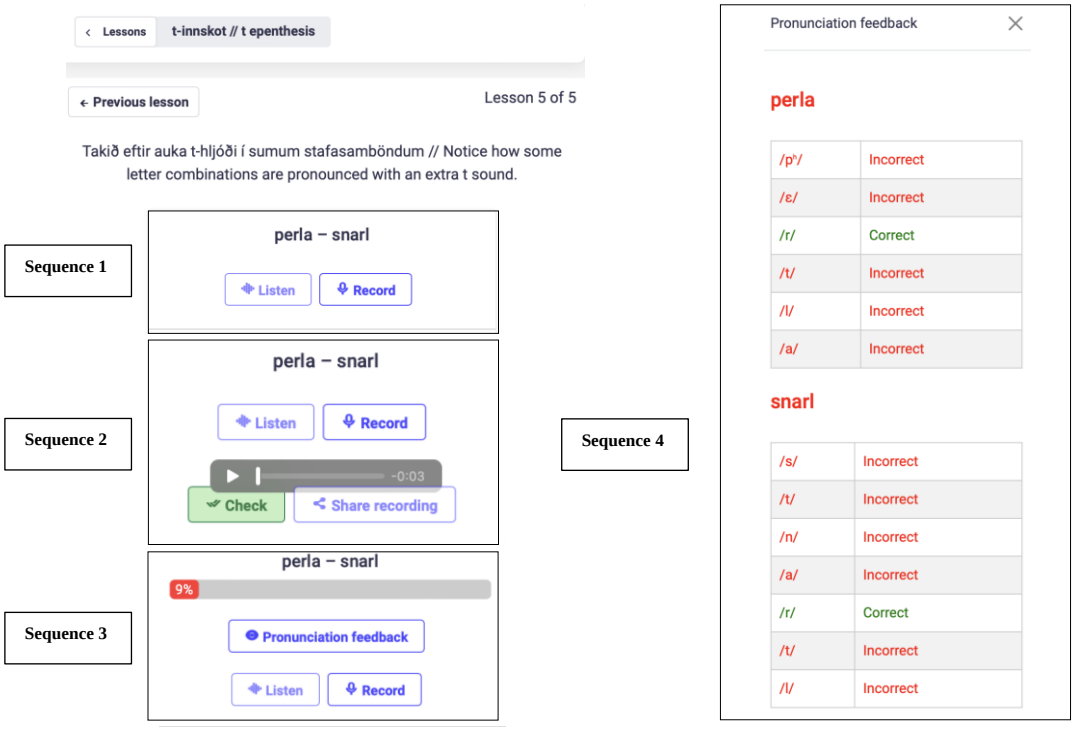


Figure 3. Feedback mechanism in CAPTinI.

Imitating L1-like speech is also part of the pronunciation training here. The ASR system applied here will use pronunciation score in each task combined with automatic visual feedback.

The CAPTinI aims at providing a visual display for pronunciation feedback including all letters in a word or phrase colour-coded to enable the learners notice any difference in pronunciation (green letters are correctly pronounced sounds, red are sounds that need more attention) along with the phonetic transcription. An overall percentage of pronunciation success is offered in a progress bar (showing 9% in Figure 3) for each task (Richter et al., 2022). Not all functionalities are yet available in the CAPTinI, e.g., sharing the learner's recording with a community of other learners in the platform to receive real-life feedback and additional instructions explaining the production of sounds in the examples are missing in the current version. Currently, the system compares recordings of the same exercises from L2 speakers with a set of L1 ('reference') speakers using the Dynamic Time Wrapping (DTW) approach (Richter et al., 2022). In this way, the accuracy of learner's pronunciation is determined by a two-way comparison, which represents the difference-to-sum ratio of the DTW score of pronouncing the same example by L2 and L1 speakers. However, the collection of recordings for each of the three hundred examples in CAPTinI is still ongoing and more data is needed for the system to calculate the sore more accurately.

 

## 4. Conclusion and future work

The reviewing of pedagogical methods used both in traditional classroom settings (Celce-Murcia et al., 1996; Þorláksdóttir and Bédi, 2024) and in various online tools for language learning (Coulange, 2022) helped better to understand the pedagogical principles applied in CAPTinI. The inspiration for designing a pedagogically curated interface has also been drawn from Icelandic Online (Arnbjörnsdóttir et al., 2020) to create speaking exercises in a scaffolded manner that users of both platforms can practise from different perspectives. As such, CAPTinI represents a practical pronunciation training with focus-on-form and focus on structure-level exercises, which builds on intuitive-imitative and analytic-linguistic pedagogy in L2 pronunciation. Similarly, CAPTinI will try to apply the development of cognitive skills by letting learners listen to their own pronunciation and detect the difference in pronunciation in specific examples such as noting the difference in pronouncing <e> compared to <i> and <í> in the words *lest – list – list* or in words including an extra <t> sound *perla – snarl* (pearl – snack) pronounced as *[per**t**la – snar**t**l]*. Two kinds of feedback are provided, instant and delayed, so that learners can instantly detect those pronunciation parts that require more attention. This is done by providing a score percentage and a summary chart highlighting parts that learners need to pay more attention, but also by reviewing all tasks later in a summary chart.

The plan to include more varied visual feedback, e.g., for prosody and word and sentence stress, will be part of future versions of CAPTinI. Future versions may also include community feedback where practitioners, L1 speakers or more advanced learners may give human feedback on learners' pronunciation.

The main advantage of CAPT tools remains the accessibility and ease of use rather than pedagogical implications (Coulange, 2022). Therefore, our CAPTinI system will provide an easily accessible online tool available to L2 Icelandic learners to assist them with pronunciation of sounds (letters, words, phrases, sentence) in a pedagogically curated manner to support L2 Icelandic pronunciation practice online.

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# Digital language learning strategies: University language learners and CALL

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***Abstract***

*The current case study examines the ways in which 31 university students learning English in central Japan use digital language learning strategies to become more autonomous learners outside the classroom. The study also examines how important students believe technology is for their own personal language learning and compares lower-tech language learning strategies to more modern ones, asking students to disclose which types of strategies they prefer to use and why (e.g., pencil and paper vs. apps and websites, etc.). The study looks closely at survey data as well as in-depth interviews that were held with a sample of the participants. The data found that students overwhelmingly use more high-tech strategies for language learning purposes and that they primarily use their smartphones to help them improve their English skills. Moreover, students reported to being conscious of how and when they use technology for language learning purposes.*

***Keywords:*** *learning strategies; autonomous learning; apps; university learners.*

## 1. Introduction

Language learning strategies (LLSs) have been of interest to both learners and teachers alike since the mid 1970s (Rubin, 1975). Essentially, LLSs are the various actions that language learners consciously and purposefully take on their own to help with their language learning. According to Oxford (1990) they are "steps taken by students to enhance their own learning" (p. 1). LLSs are traits of autonomous learners who want to take more control of their learning and can be as simple as making flashcards or keeping a journal in the target language. Importantly though, as technology advances, so do the various types of digital language learning strategies (DLLSs) that become available to learners. Leaners can now easily make flashcards on their smartphones, practice their pronunciation using websites/apps, or even use AI to help with their language learning. Learners can also listen to podcasts for free for hours at a time in their target language or use the internet to find language exchange partners.

This case study will shed a light on the DLLSs that a sample of English learners in Japan have found to be the most useful as well as highlight their opinions regarding lower-tech related LLSs. It will add to what we have already learned from previous studies that have examined the various ways in which language learners use technology and their preferences for how and when they use it for studying purposes. For example, Wood (2020) found that 18 advanced-level English learners at a Japanese university were using technology for their language learning in conscious and deliberate ways and that for the students in his study, technology was a "useful tool for language learning" (p. 102). Son, Park, and Park (2017) examined the digital literacy of 170 university students

 

studying English in two different learning contexts. In Australia 100 students were questioned about their digital literacy and the types of digital tools they used for language learning while 70 were surveyed in Japan. According to Son, Park, and Park (2017) "The results of the two studies indicate that all participants were aware of digital technologies and were interested in using them" and that participants in both groups "found out new digital technologies mainly from websites, friends or social networks" (p. 93). Although previous research has brought to light many useful and important points regarding the types fof digital tools and strategies language learners use, as technology continues to advance, so does the need for further research in order to keep up with it.

## 2. Method

### Context and participants

Surveys were anonymously collected from 31 university students enrolled in two English courses at two private universities located in central Japan (see Table 1 for survey questions and answers). One course was an English oral communication course and the other was a course dedicated to language learning strategies and motivation. Surveys were followed up by in-depth interviews with a sample of 4 volunteers from the group. The interviews consisted of nine interview questions and lasted around 20 minutes per student. For privacy reasons, names of those who were interviewed have been changed to pseudonyms when discussed in this paper. Furthermore, students who were interviewed all signed consent forms allowing the researcher to use statements they made during their interviews for research purposes. On the surveys and in the interviews, students were asked about their use of LLSs, particularly in the case of any that involved the use of more recent technology. Students were also asked which types of strategies they found more useful, lower-tech learning strategies (e.g., making paper flashcards, making notes by hand in class, etc.) or more modern-tech learning strategies (e.g., making flashcards on their smartphone, listening to podcasts in the target language, etc.). Overall, the study aimed at exploring two research questions:

(1) Which do university students in Japan use more, lower-tech or higher-tech language learning strategies?

(2) How important do students feel technology is for their language-learning process?

## 3. Results and discussion

The survey data show that the majority of students use more modern-tech related DLLSs to help them improve their English skills and that they find it very important for their language learning overall. Furthermore, more than 90% of the students surveyed reported to having language learning apps installed on their smartphones which they use on a regular basis. When surveyed about how students find these types of language learning apps, the majority reported that they search for them by themselves. Taking this kind of initiative highlights the autonomous nature of these students' learning styles and attitudes regarding language learning. According to the survey data, one of the most useful DLLSs for students was watching (and listening) to YouTube. Examples from the anonymous survey comments included things like "YouTube, unlimited sources that keep me entertained" and "I think YouTube is the most useful language learning strategy because there are many materials that are suitable for English learning." Moreover, many students found language learning apps and podcasts in their target language useful, writing comments such as "Using apps to memorize vocabulary is more effective than traditional ways" and "With podcasts we can learn native pronunciation and new vocabulary" (see Table 1 for more examples of open-ended survey answers).

Students who were interviewed occasionally mentioned YouTube, but they also gave other examples of more diverse DLLSs they used. According to Honoka, "I used apps, Duolingo and Hello Talk. I sometimes watch Netflix, so watching dramas. Also, I watch YouTube… Podcasts, I listen to 6 minutes in English. I listen to it every day because it's short." Honoka continues in her interview by giving a more detailed description of how she uses the app Hello Talk. She says that "So, Hello Talk, we can talk with a lot of people, and then I text and send voice messages to foreign language speakers. I don't care about my English skills because it's um…it's very relaxed and the app helps me with, for example, I can talk to a lot of people and I can send voice messages." Additionally, Honoka uses technology to improve her reading and writing skills. She reported that "I

 

often text in English with my friends and I sometimes post in English on Instagram or Twitter. And I can catch some phrases on Twitter." Hide also describes how he uses technology for language learning purposes. In his words, "In many ways I use technology for my learning. The most important applications are smart news and podcasts. It's easy to use and I can do it myself." Risa currently uses apps to help her learn English as well as French. According to her, "I'm learning French now at this university and I use YouTube and Duolingo for that too. YouTube videos that teach us grammar. " She continues by saying that for Duolingo, she uses it every day because "Consistency is important." Tomo discussed a website called Forvo that he uses to help improve his English pronunciation. "Forvo is pretty good for pronunciation, no matter the language. You usually have natives pronouncing words you're looking for." Tomo also mentioned using the live-streaming platform Twitch for language learning purposes. He reported that "…to be exposed to that English [natural/everyday English], I started watching Twitch TV and I would specifically watch IRL [In real life] streams where people go out and speak to people on the street. Specifically, I would watch Pokémon IRLs where people go out and talk about Pokémon to random people in English."

Based on both the survey and interview data, we can see that students consciously and purposefully integrated the use of techonology into their language learning routines. They took the inititiave to seek out new websites or apps by themselves in order to help improve their English abilities in their own time. In short, these students took control of their own learning with the help of technology. Students improved their listening comprehension by listening to podcasts on their smartphones or watching things in their target language on YouTube or other streaming websites. Essentially, these students consciously used various DLLSs to improve their language skills.

**Table 1.** Survey results.

**Digital Language Learning Strategies Survey**

**1. With language learning strategies, do you use more low-tech strategies (writing notes by hand, handwritten flashcards, etc.) or hi-tech strategies (flashcards on your smartphone, listening to podcasts, etc.)?**

Lo-tech: 10 Hi-tech: 20 N/A: 1

**2. How often do you use the Internet or smartphone applications (apps) to study a language?**

Every day: 14 2-3 times a week: 15 Once a week: 2 Never: 0

**3. How important is technology for your language learning?**

Very important: 16 Important: 12 A little important: 3 Not important at all: 0

**4. For general language learning, which do you think is better, using modern technology (websites/apps) or traditional methods (pen/pencils, notebooks, paper books, etc.)?**

Modern technology: 18 Traditional methods: 10 N/A: 3

**5. Do you currently have any language learning apps on your smartphone?**

YES: 28 NO: 3

*If yes, what ones do you have?*

- Quizlet - Native Camp - X Reading – WordHolic - BBC News app – Weblio - Deep L – Duolingo – Drops – Anki - Hello Talk

**6. How do you learn about new language learning websites or applications?**

From friends: 5 I search for them myself: 23 I don't use any: 1

Other: 2

**7. For you, what has been the most useful language learning strategy that uses modern technology? Why?**

 

*Some examples of student answers:*

- "YouTube, unlimited sources that keep me entertained."
- "Duolingo. Not too difficult, but not too easy."
- "Using apps to memorize vocabulary is more effective than traditional ways."
- "Listening and watching a lot of content on YouTube and podcasts."
- "Listening – I can listen to podcasts and watch Netflix or YouTube anytime and anywhere."
- "With podcasts we can learn about natural conversation when you listen."
- "YouTube – You can learn native pronunciation and new vocabulary."

**8. What other digital language learning strategies do you use?** Please write a sentence or two.

*Some examples of student answers:*

- "Native Camp because we can practice to speak English whenever you want."
- "I use TED to listen some speech. I can watch subtitles."
- "YouTube. It's fun and easy way."
- "I sometimes use Instagram to learn English."
- "Texting with native speaking friends."
- "Checking grammar by ChatGPT."
- "I often use Google Scholar for my English learning, in particular reading…we can learn academic English."
- "Chatting with a foreigner in direct message on Instagram."

## 4. Conclusion

Between the surveys and interviews, we can conclude that the use of technology for language learning is seen as quite important to this current generation of language learners. Although some students reported to using more low-tech strategies (e.g., note-taking by hand or making paper flashcards), the majority of them reported that they use more modern-tech related DLLSs. The data show that the majority of these learners actively use technology outside of class to help improve their English language abilities. In short, they are taking control of their own learning after the class bell rings and using technology to help them become more autonomous learners. This self-directed learning outside of class relies heavily on websites and smartphone apps that the learners have either sought out themselves or learned of through friends and/or classmates. The findings from this case study are similar to those highlighted by Son, Park, and Park (2017) and Wood (2020) and show how language learners can use technology to become more autonomous learners in their own time. According to Benson (2011), "In the course of its evolution, the concept of autonomy has become part of the mainstream of research and practice within the field of language education" (p. 17) while Son, Park, and Park (2017) believe that by improving the digital literacy skills of language learners, they have the potential to become "effective and independendant learners who can take advantage of the tools and resources for language learning in authentic contexts" (p. 95). Although the concept of autonomous learning is not new itself, the technological tools students now have at their disposal continue to either be improved or newly created. As technology continues to advance, so do the types of strategies our learners can take advantage of to become more autonomous learners outside the classroom.

 

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# Digital tools and gamification in minoritised language contexts: (Un)availability, needs, and future perspectives

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***Abstract***

*"RISE UP – Revitalising Languages and Safeguarding Cultural Diversity" is a HORIZON EUROPE project that aims to empower minoritised language communities in Europe. It focuses on five selected case study languages, namely Aranese, Aromanian, Burgenland Croatian, Cornish, and Seto. This paper highlights the project's focus on methods for language revitalisation, with a particular emphasis on digital tools and services, and relates it to the development of the RISE UP digital toolkit. It draws on ethnographic research and preliminary data (n=455) of a survey that was adapted for the five language communities and translated into over 15 languages. Research data discussed in this article includes the exploration of the digital apps and services identified for the selected languages, how survey respondents receive some digital resources, and where they identify a lack of resources. Findings across the communities are compared and potential further needs are identified. Building onto this, the RISE UP digital toolkit is introduced and showcased as a comprehensive platform for learning and practising endangered languages, integrating gamification and user-friendly interfaces. It includes language learning games, language resources, a Linguistic Risk-Taking Tracker, and a community forum for user engagement. To conclude, the need for this toolkit is discussed.*

***Keywords:*** *language revitalisation; minoritised language; digital resources; gamification.*

## 1. Introduction

About half of the 7,000 languages used worldwide are considered endangered, meaning that they risk falling out of use and potentially facing extinction within a few decades. Revitalisation efforts are one response to this threat (Austin & Sallabank, 2011). According to Austin and Sallabank (2011), the promotion of language revitalisation "has the goal of maintaining living languages in their sociocultural contexts (i.e. in linguistic ecologies), and giving speakers the possibility to continue their use as well as passing them on to their descendants" (p. 22). The HORIZON EUROPE project "RISE UP – Revitalising Languages and Safeguarding Cultural Diversity" – on which this paper is based – also targets language revitalisation and aims to empower minoritised language communities by connecting relevant actors, identifying good practices that are already

 

available, and developing new methods using a multi-disciplinary approach.[1] The project focuses on five selected language communities in Europe, namely Aranese (Spain), Aromanian (Albania, Bulgaria, Greece, North Macedonia, Romania, Serbia), Burgenland Croatian (Austria), Cornish (United Kingdom), and Seto (Estonia).

RISE UP is a Coordination and Support Action and has a project duration of 36 months (02/2023-01/2026). Eight partners from six European countries are involved in the project, namely MINDS & SPARKS GmbH, University of Tartu, University of Vienna, ESPRONCEDA Institute of Art & Culture, Youth of European Nationalities, NUROGAMES GmbH, School of Oriental and African Studies, and University of Roehampton.

In this paper, we focus on the aspect of digital tools and gamification in the context of the five RISE UP case study communities. Traditional efforts to revitalise languages are often associated with intergenerational transmission and how to foster it (Fishman, 1991). Other approaches highlight how important it is to enter new domains of language use and expand to new speakers (O'Rourke & Pujolar, 2013). When it comes to language safeguarding and revitalisation methods, the research conducted in the RISE UP project comprises three theoretical orientations (Cajka et al., 2024b; see also Cajka et al., 2024a)[2]:

- A linguistic ecology approach: According to Mühlhäusler (2018), taking an ecological approach to language revitalisation involves the creation of a sustainable future for languages and varieties. Revitalisation efforts encompass maintaining linguistic diversity, restoring functional connections between different languages and varieties, and embedding them within meaningful cultural, economic, and ecological contexts.
- An interest in language users: New speakers are conceptualised as "individuals who put their energy and effort into learning and using a minoritised language, be they originally labelled "traditional" speakers with partial competence, newcomers, or any other members of the communities" (Cajka et al., 2024b, p. 12).
- A usage-based approach to language learning: Teaching, learning, and using languages are conceptualised as closely linked (Ellis, 2015).

As new language users are essential for the vitality of a language and face-to-face opportunities for target language use are often scarce in minoritised language contexts, digital opportunities can play a very important role in the learning and use of an endangered language. In this sense, CALL (Computer-Assisted Language Learning) seems to be particularly important for minoritised languages. CALL can provide them with access to resources that might otherwise be not available (Ward, 2015). In our understanding of a usage-based approach to language learning, any interaction with a digital tool, app, or service in the minoritised language can be an opportunity for language learning and can therefore be associated with CALL. However, there are concerns about a 'digital divide', meaning that minoritised languages' access to and use of technologies compared to dominant languages is characterized by an imbalance (UNESCO, 2022, p. 289). This paper explores which digital apps and services for the five selected languages can be identified, how respondents to the RISE UP questionnaire survey receive some digital resources, and where they identify a lack of resources. The findings across the five case studies are compared, initial conclusions are drawn, and further needs regarding digital resources are discussed. Building on these preliminary results, we then introduce the RISE UP digital toolkit and conclude with a discussion of the need for it.

## 2. Method

The data discussed in this paper was collected through ethnographic research (including site visits, meetings with community contacts, and desk research online, happening in a recursive process over several months) as well as

[1] For more information, please visit the project website www.riseupproject.eu.

[2] The project deliverable (Cajka et al., 2024b) providing more in-depth information will be published here: https://www.riseupproject.eu/about/

 

an online questionnaire survey among the five RISE UP case study communities, hosted on Microsoft Forms. It was adapted for each of the case study communities and then translated into over 15 language varieties (see Cajka et al., 2024a and 2024b for more information). All of this happened in a joint effort of the RISE UP consortium.

The data presented in this paper was accessed in March 2024 and is preliminary, as the survey was still ongoing at that time. It comprises 455 responses and was analysed using descriptive statistics. It is important to note that the data provides initial insights into the perceptions of the survey respondents, but it is not representative of the entire case study communities. As the data is still preliminary, the number of responses for the five language communities varies. In order to contextualise the data, we present a brief overview of the demographic characteristics of the respondents in each of the case study communities.

**Aranese.** A total of eight participants completed the questionnaire. The majority of respondents indicated an age between 30 and 49 years. One respondent reported to be between 18 and 29; two assigned themselves to the age category of 50 to 69 years. Four respondents identified as male, three as female, and one person preferred not to disclose their gender. All survey respondents reported having completed higher education (e.g., university, college).

**Aromanian.** 228 persons responded to the survey. Almost 40% of the participants indicated that they are between 30 and 49 years old, while over a third of them (35.5%) stated that they are between 50 and 69 years old. 8.3% of respondents reported to be 70 or older, and approximately 16% reported to be under the age of 30 (with 14.9% in the 18-29 age range and 1.3% between the ages of 10 and 17). The gender distribution was relatively balanced, with 53.9% identifying as male and 44.7% as female. One respondent indicated to be non-binary and two preferred not to disclose their gender. The majority of respondents (86.8%) have reportedly completed higher education. 10.1% indicated secondary school to be the highest education they have completed. Six individuals reported vocational training and one person reported primary/elementary school as their highest completed education.

**Burgenland Croatian.** The questionnaire was completed by a total of 115 people. With regard to age, those reportedly aged between 30 and 49 account for the largest proportion with 36.5%. This is followed by the age group of 50 to 69 with 27%. 26.1% indicated to be aged between 18 and 29, and 10.4% of the respondents reported being 70 years of age or older. 60% of the respondents identified as female, 36.5% as male. A further 3.5% of respondents preferred not to disclose their gender. In terms of the highest completed education, almost three quarters (74.8%) of the respondents have reportedly completed higher education. The remaining quarter is distributed as follows: 16.5% indicated that they have completed secondary school, 7% stated that they have completed vocational training and two people selected the 'Other' option.

**Cornish.** 37 questionnaires were completed for Cornish. More than half of the respondents (54.1%) were reportedly aged between 50 and 69 years. The age group between 30 and 49 constitutes 27% of the sample. 16.2% of respondents indicated to be between 18 and 29 years old, while 2.7% stated to be aged 70 or above. The majority (54.1%) identified as male, 35.1% as female. A further 5.4% of respondents identified as non-binary and 5.4% preferred not to disclose their gender. The majority of respondents have reportedly completed higher education (83.8%). 10.8% indicated that the highest level of education they have completed was secondary school and 5.4% reported having completed vocational training.

**Seto.** A total of 67 persons completed the survey for Seto. The majority of respondents reported to be 50 years and older, with 50.7% in the 50-69 age group and 7.5% in the 70-or-older age group. 26.9% indicated to be between 30 and 49 years old, 9% stated to be in the 18-29 age group, and 6% responded to be aged between 10 and 17. The majority of participants (56.7%) identified as female, 40.3% as male. 3% decided not to disclose their gender. In terms of the highest level of education completed, 64.2% of respondents indicated higher education, 13.4% vocational training, and 11.9% secondary school. 6% indicated primary/elementary school as the highest education they have completed, while 4.5% selected the 'Other' option.

 

## 3. Preliminary results

### 3.1. Identified digital apps and services[3] for the five case study communities[4]

As part of the research in RISE UP, already available resources were identified with regard to the five case study communities (Cajka et al., 2024a). In this context, the term 'resources' encompasses everything "that requires the active or passive use of the minoritised language. I.e., people have to use the minoritised language to interact with the respective resource or engage in the respective activity." (Cajka et al., 2024a, p. 15). This paper highlights the findings regarding digital apps and services, relates them to survey data and the development of the RISE UP digital toolkit. The lists of digital apps and services identified for the five selected case study communities that we refer to in this paper can be found in Cajka et al. (2024a, pp. 36-73). They are based on our initial research and are still a work in progress. These lists do not claim to be exhaustive but will expand as the project progresses. A digital version of the current list of identified resources is available under this link: https://www.riseupproject.eu/resources/. It provides an opportunity for users to add resources that will contribute to the growth of the list.

In general, there seem to be very few digital apps and services for the five selected languages. Online dictionaries are available for all of them, but otherwise the resources identified vary widely between the five communities.

The largest number and broadest range of resources – though still very small compared to the numbers of resources available for majority languages such as English or German – were identified for Cornish. These included various online learning resources (such as audio courses or language learning apps), games (such as "Kerdle", the Cornish version of Wordle) and digital services (such as autocorrect for Cornish).

With regards to Burgenland Croatian, it was interesting to see that of the four resources identified, two were related to music. The web application "Pjesmio" allows users to collect, share, and present song lyrics, and "Zajačimo si" is a songbook app of popular Croatian folk and pop songs.

For Aromanian, an online library was identified, as well as some online offerings explicitly related to language learning, such as an online learning platform, online learning resources, or online courses. With regards to Aranese, we identified a translation tool and various online dictionaries. Seto was the case study community with the least number of digital apps and services identified (two online dictionaries).

### 3.2. Reception of specific resources

To find out more about respondents' general perceptions of specific resources, we listed several resources (which had already been identified at the time the questionnaire was designed) and asked respondents how important they found them. They were able to respond on a 5-point scale from 'extremely important [5]' to 'not at all important [1]' and the alternative option 'I don't know this resource [0]'.

With regards to Aranese, most of the online resources listed, except for one (which was also unknown to 37.5% of the respondents), were considered (extremely) important by the majority of respondents. Responses to the Aromanian questionnaire were even more straightforward, with each resource listed being considered (extremely) important by at least 68% of the respondents. In the case of Seto, the two online dictionaries listed were perceived to be (extremely) important by a high percentage of respondents (with 91% and 88.1% ranking them as (extremely) important).

[3] Under digital apps and services, we understand "Phone apps in/for the case study language / the case study community (e.g. online dictionaries), and digital tools/services available in the case study language, such as Wikipedia, machine translation, computer operating systems, mobile phone software, chatbots, games for PC/phone." (Cajka et al., 2024a, p. 19). More information on this categorisation and its development can be found in Cajka et al. (2024a).

[4] This and more findings regarding the resources identified for the five RISE UP case study communities have been published in Cajka et al. (2024a).

 

For Burgenland Croatian, the online dictionary "rječnik.at" had the highest percentage of respondents considering it (extremely) important (86.1%). For all the other resources listed, far more respondents perceived them to be (extremely) important than not (at all) important, but it was noticeable that they were unknown to a considerable number of participants.

The results for Cornish were similar to those for Burgenland Croatian. In general, more respondents perceived the listed resources to be (extremely) important than not (at all) important. For the option "Learning platforms (e.g. Go Cornish or SaySomethingInCornish)", 86.5% of the respondents indicated that they find it (extremely) important. The "Online Cornish Dictionary" received an even higher rating, with 94.6% of respondents considering it (extremely) important. The digital game "Kerdle" elicited more divergent responses, with 29.7% of respondents perceiving it as (extremely) important and 18.9% perceiving it as not (at all) important. Similarly to Burgenland Croatian, some listed resources had a considerable number of respondents choosing the 'I don't know this resource [0]' option.

### 3.3. Perceived lack of resources

To explore the areas in which respondents perceive resources in the respective language to be most lacking, we provided a list of areas ('Media', 'Events', 'Literature and non-fiction works', 'Music', 'Facilities and services', 'Competitions/awards', 'Further resources/offerings', 'Digital services', 'In no area') and an open-ended 'Others' option. Respondents were allowed to select as many options as they found appropriate.

'Digital services' was one of the top three areas where resources were reported to lack the most for Aranese and Aromanian. For Burgenland Croatian, it was even chosen most frequently as an area where resources for Burgenland Croatian lack the most. Interestingly, 'Media', 'Literature and non-fiction works' and 'Facilities and services' ranked as the top three areas where resources in the language lacked reportedly the most for Cornish. 'Digital services' was ranked fourth, along with the 'Events' category. For Seto, 'Digital services' ranked fifth out of 10. The areas that were perceived to lack the most for Seto resources were the same as for Cornish: 'Media', 'Literature and non-fiction works' and 'Facilities and services'.

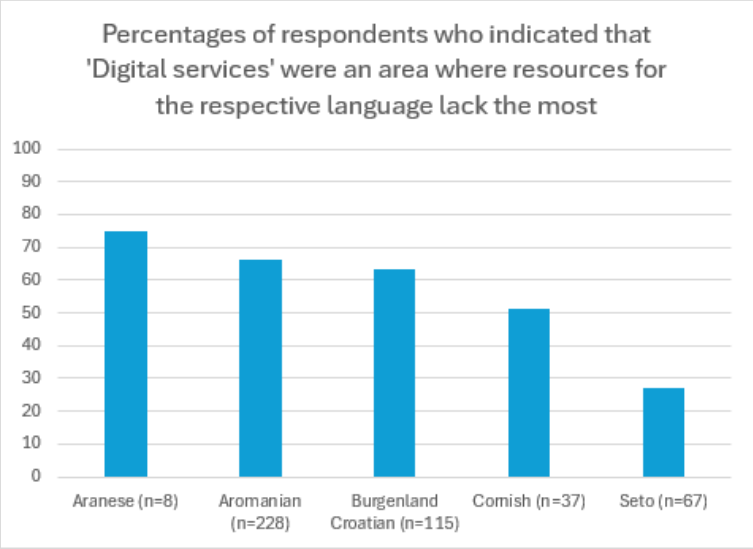


Figure 1. Percentages of respondents who indicated that 'Digital services' were an area where resources for the respective language lack the most

To gain further insights, we compared the percentage of respondents who identified 'Digital services' as an area where resources for their respective language lack the most from the five respective language communities. This is illustrated in the figure above. Despite the differences between the case study communities in terms of their

 

number of respondents, there was a considerable number of participants who identified 'Digital services' as an area where resources for the respective language lack the most. For four out of five communities (Aranese, Aromanian, Burgenland Croatian, and Cornish) more than 50% of the respondents ticked this option. For Seto, however, only 26.9% indicated that 'Digital services' was an area where Seto resources lack the most.

## 4. Discussion

In the previous section, we discussed preliminary results with regards to which digital apps and services for the five selected languages could be identified, how respondents to the RISE UP questionnaire survey received some digital resources, and where they identified a lack of resources.

The findings illustrate that the digital apps and services available in the five RISE UP case study communities are notably scarce, even though some of them appear to be better equipped than others, as in the case of Cornish. Online dictionaries are available in all five communities and can therefore be considered a standard tool. Otherwise, the lack of resources in the digital sphere is evident, which ties in with the digital divide mentioned by UNESCO (2022). For three of the five case study communities we could not identify any digital resources explicitly for language learning, revealing a gap in this respect. While some digital language learning tools were found for Cornish and Aromanian, there may be room for more.

A lack of resources for the five minoritised languages is also suggested by the preliminary survey results. For Aranese, Aromanian, and Burgenland Croatian, 'Digital services' ranked in the top three areas where resources for the respective case study community language lack the most. But also other areas such as 'Media' or 'Literature and non-fiction works' ranked frequently among these top three areas, suggesting a wide-ranging need for resources in these minoritised languages. However, when comparing the percentages of respondents who identified 'Digital services' as an area where resources in the respective language lack the most, it was found that in four out of five case study communities, over 50% of respondents selected 'Digital services'. These preliminary findings indicate that only the Seto respondents exhibited a comparatively lower need in the digital sphere, with approximately a quarter of respondents who selected 'Digital services' as an area where Seto resources lack the most. One explanation for this, and also for the fact that 'Digital services' did not rank in the top three categories where Seto resources lack the most, may be that more than 57% of the respondents were 50 years or older. However, more statistical analyses are needed to explore this further.

The findings regarding the reception of specific resources show that there were more respondents who considered most of the digital resources listed in their respective version of the questionnaire to be (extremely) important than respondents who considered them to be not (at all) important. For Burgenland Croatian and Cornish, it was particularly noticeable that some of the resources are unknown to a considerable number of respondents. With regards to Burgenland Croatian, these findings may be due to the demographics of the respondents, as only about a quarter of them reported to be under the age of 30, or to a lack of advertisement for these resources (see Cajka et al., 2024b, for more details on the aspect of advertisement regarding language revitalisation resources). In any case, unknown resources are unfortunate as they cannot fulfil their full potential if they are not well known in the respective community (see Cajka et al., 2024b, for further explanations in this regard).

Given that these results are based on preliminary data and that the survey data was analysed with descriptive statistics, further detailed analyses of the final survey data combined with more in-depth qualitative and/or ethnographic data are required to gain a more nuanced understanding of the needs of the five selected language communities.

## 5. The RISE UP digital toolkit

The RISE UP digital toolkit represents a new perspective in the efforts to revitalise and safeguard endangered languages within Europe (Shekhawat, 2024). This comprehensive platform is designed to support the learning, practice, and revitalisation of minoritised languages through a blend of advanced technologies and community-

 

driven features. By integrating gamification and user-friendly interfaces, the toolkit aims to create an engaging and immersive experience for users, bridging the gap between traditional language learning methods and modern digital solutions. The key features of the app are:

1. **Language Learning Games.** The toolkit includes a variety of language learning games tailored to each of the five case study languages: Aranese, Aromanian, Burgenland Croatian, Cornish, and Seto. These games are not only educational but also culturally informative, providing insights into the history, traditions, and values of each community. By making learning fun and interactive, the games encourage consistent practice and deeper engagement with the language. The design of the lesson plan includes thematic sections, that are split up into several units. Each unit starts with an authentic text (i.e. mostly a dialogue) that is based on daily interactions. This is followed by several exercises that focus on chunk learning, sentence structure, grammar, and vocabulary. The structure of the exercises is designed to facilitate any verified and approved user to create a language course for the application.
2. **Digital Resources.** To further aid language learners, the toolkit can offer dictionaries and thesauruses for each language. These resources are essential for expanding vocabulary and understanding language nuances, making them valuable tools for both new and experienced learners.
3. **Linguistic Risk-Taking Tracker.** An innovative feature of the RISE UP toolkit is the Linguistic Risk-Taking Tracker. It adapts the concept of Linguistic Risk-Taking (Cajka et al., 2023; Roodi & Slavkov, 2022; Slavkov & Séror, 2019) for a minoritised language learning application. This tool encourages users to practice the language in real-life situations, promoting confidence and proficiency. By tracking the progress of the user and rewarding each linguistic risk with in-app reward points and badges, the toolkit motivates users to step out of their comfort zones and actively use the language in their daily lives.
4. **Community Forum.** Community engagement is a cornerstone of the RISE UP digital toolkit. The integrated forum allows users to connect, share experiences, create events, and participate in discussions. This feature fosters a supportive network of language learners and more proficient language users, enhancing the sense of community and shared purpose among users, which increases the engagement and promotes collective motivation towards language usage.

Gamification plays a pivotal role in the RISE UP digital toolkit, making language learning more engaging and rewarding. The toolkit incorporates several gamification techniques that cater to the diverse needs of its users:

1. **Progression Levels and Points System.** Users can advance through various levels that reflect their mastery of the language, earning points for completing lessons and challenges. This system provides a clear sense of progress and achievement, motivating users to continue their learning journey.
2. **Badges and Achievements.** Badges are awarded for specific accomplishments, such as mastering key vocabulary. These visual markers of success not only recognise user efforts but also add an element of fun and competition.
3. **Daily and Weekly Challenges.** Time-bound challenges encourage regular engagement with the language. These challenges can range from vocabulary exercises to quizzes, offering extra points and rewards upon completion.
4. **Leaderboards and Social Interaction.** Leaderboards create a sense of friendly competition, while social interaction features such as peer-to-peer communication and group challenges promote collaboration and community building.

The app will be available for iOS and Android. A web platform will also allow verified and approved users to create language courses accessible to all app users for that language.

 

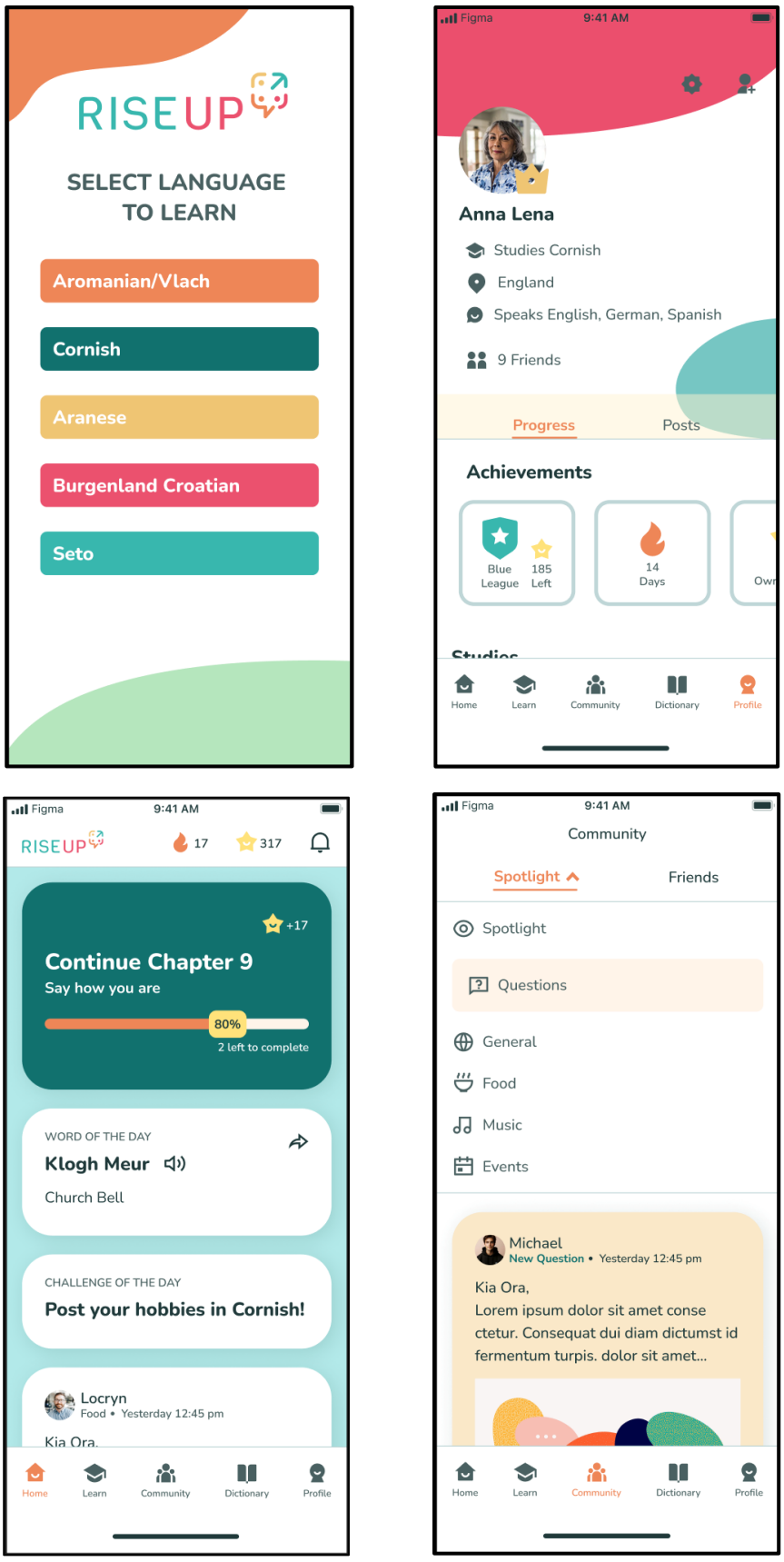


Figure 2. Designs of the RISE UP Digital toolkit v1

 

## 6. Conclusion: The need for a digital toolkit

Preliminary data discussed in this paper suggests a considerable lack of resources in the selected language communities. Current digital services, media, and literature – but also other resources for these languages – are notably lacking, creating barriers to effective language learning, language use, and revitalisation. For instance, in the Aranese community, there is a perceived shortage of digital services despite the high importance placed on most of such resources by the survey respondents. Similarly, the preliminary findings for Aromanian suggest a need for more resources with regards to media, digital services, and literature – resources that are crucial for sustaining and promoting the language. The Burgenland Croatian and Seto community, too, appear to have limited access to essential digital resources in their languages, making it difficult to support minoritised language use and learning effectively. While Cornish has the most digital apps and services identified compared to the other four languages, it is still far less than what is available for majority languages.

We suggest the RISE UP digital toolkit as an answer to the multiple challenges for minoritised languages in a globalised and digitalised world. The toolkit aims to fill these gaps by providing a comprehensive suite of digital resources tailored to the specific needs of these communities. It offers language learning games, which are not only educational but also engaging, making the process of learning more interactive and enjoyable. This is a significant improvement over current resources, which often lack interactive and gamified elements that can motivate learners. Additionally, the toolkit aims to include a comprehensive digital dictionary and thesaurus, as they are paramount to any language and their perceived importance is also mirrored in the survey responses.

Another innovative feature of the RISE UP toolkit is the Linguistic Risk-Taking Tracker, which encourages users to practise the language in real-life situations. By tracking and rewarding users' efforts to use the language in various contexts, the toolkit promotes active engagement and practical application of language skills. This feature is particularly important in minoritised language contexts, where opportunities for face-to-face language use can be scarce.

Furthermore, the toolkit aims to foster community engagement through its integrated forum, a feature that might be used on social media, but is not widely available in current digital resources. This forum allows users to connect, share experiences, create events, and participate in discussions, building a supportive network of language learners and speakers. This community aspect is vital for sustaining language use and fostering a sense of belonging among users. By providing a platform for social interaction and community building, the toolkit addresses the isolation that many minoritised language speakers might experience, offering a space for mutual support and collaboration.

In this paper, we have discussed the RISE UP digital toolkit being developed for the five selected language communities Aranese, Aromanian, Burgenland Croatian, Cornish, and Seto. The goal is, however, that the structure behind it can be adapted to minoritised languages beyond these five communities, potentially opening up future perspectives for language revitalisation in the digital sphere.

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# Eight years of designing Augmented Reality applications: Collaboration, challenges, and contradictions

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***Abstract***

*This paper draws from over eight years of experience in designing and developing augmented reality (AR) applications focused on culture, history, second and foreign language learning, multilingualism, and other salient values. Guided by Design-based research (DBR) (Amiel & Reeves, 2008), the study captures the multifaceted, complex, and collaborative processes involved in designing, developing, and deploying AR applications for the DiMPAH and DIMPE projects. An interdisciplinary team of researchers, a software developer, and experienced instructors collaboratively navigate through the complex iterative processes. The study demonstrates that the design and development processes are galvanized by problem analysis, pedagogical and technological values, iterative testing and improvement, and reflection principles. The nature of each European project determines the design and development of the AR applications, as well as the task-driven activities, learning experiences, and intended pedagogical values that are shaped by institutional requirements and instructors' and students' teaching and learning needs.*

***Keywords:*** *CALL; augmented reality; design-based research.*

## 1. Introduction

Augmented reality (AR) superimposes digitally designed artifacts onto the physical environment without occluding the user's view of the actual surroundings, creating immersive and interactive experiences. As Azuma (1997) notes, "AR allows the user to see the real world, with virtual objects superimposed upon or composited with the real world. Therefore, AR supplements reality, rather than completely replacing it" (p.356). Several theoretical and practical frameworks have been developed to investigate the multifaceted and complex processes involved in the design, development, and deployment of AR applications (Klopfer & Squire, 2008; Hadjistassou et al., 2023; Silva, et al., 2024). Its pedagogical potential and implications have also been demonstrated by multiple scholarly studies (Klopfer & Squire, 2008; Thorne, et al., 2021; Hadjistassou & Louca, 2023; Hadjistassou, et al., 2023). Some studies have drawn on DBR to investigate its iterative testing and refinement in situated contexts and relevance, its user-centered approach, and stakeholder involvement in the design process, as well as the integration of both theoretical and practical values (Klopfer & Squire, 2008; Hadjistassou et al., 2023). The iterative cycles

 

driving DBR facilitate optimization of AR applications through real-life refinement and advancement, offering technologically and pedagogically constructive activities that can be scaled and adapted in different learning contexts. At the same time, it promotes the development of theoretical frameworks embedded in empirical data. Despite DBR's value, only a few studies have delved into the complex, multifaceted, and collaborative processes involved in the design and development of AR as part of various funded projects. Drawing on two European projects, DiMPAH and DIMPE, this study investigates the processes involved in designing AR applications focused on cultural heritage, second/foreign language learning, multilingualism, and other salient values that were used for learning and collaboration (Hadjistassou et al., 2021; Hadjistassou, et al., 2023; Hadjistassou & Louca, 2023). Specifically, the study addresses the following research questions: (1) What are some the underlying collaborative processes involved in designing and developing AR applications for second/foreign language learning and culture? (2) What are some of the pedagogical and technological considerations, affordances and contradictions that need to be contemplated during the design and development process? (3) What is the role and contribution of an interdisciplinary team in this process?

## 2. Method

Using Amiel and Reeves (2008) Design-based Research (DBR) approach, which is grounded in the complex interplay between socially situated settings and the iterative design cycle, the study explores the complex processes of designing and developing AR applications. An interdisciplinary research team designed six AR scenarios for each project, focusing on culture, second/foreign language learning, multilingualism, and other salient values that were deployed for language learning and collaboration (Hadjistassou et al., 2021; Hadjistassou, et al., 2023; Hadjistassou & Louca, 2023). The nature of each project, including pedagogical goals and objectives and funding requirements, determined the design and development of the AR applications, task-driven activities, learning experiences, and intended outcomes that were shaped by institutional requirements and instructors' and students' teaching and learning needs. The AR activities were designed to be task-driven, engaging, and interactive. Expanding on Amiel and Reeves' (2008) framework, four steps were identified, shedding light on the implications, demands, and contradictions involved in AR design and development.

## 3. Results and discussion

Results indicate that the design process is inherently complex, involving interconnected stages within an iterative cycle driven by multifaceted design, development, deployment, and evaluation procedures. Multiple technological, pedagogical, and cultural variables needed to be contemplated throughout this process. Close collaboration among an interdisciplinary team was required from the onset until the completion of the project to consider the multiple design and development aspects, as well as the pedagogical potential, and cultural values. This collaborative endeavor ensured that diverse insights were integrated into the AR scenarios, enhancing their pedagogical relevance and value. Additionally, ongoing communication and feedback loops were crucial for addressing challenges and adapting to evolving project needs. Due to space constraints, this paper will focus on four areas:

### 3.1 Multifaceted problem analysis

Drawing on each project's goals and objectives and the practical pedagogical problems stemming from our team members' teaching experience in diverse fields, such as teaching English and Spanish as foreign languages, we discussed these practical challenges with consortium partners. These challenges included but were not limited to the (a) integration of AR into foreign language learning; (b) selection of possible AR authoring systems; (c) involvement of stakeholders in the design of AR applications for learning; (d) creation of pedagogical activities tailored to students' needs; (e) provision of infrastructure and technological support for using AR; and (f) allocation of training, time, and incentives needed to implement AR in different contexts. Consortium partners across Europe reported similar challenges and stressed the necessity of developing flexible, scalable AR applications tailored to teaching and learning needs. In parallel, we also considered EU requirements, guidelines, and constraints to ensure compliance and relevance at a pan-European level. This framework offered consistent, data-driven insights,

 

guiding improvements and adaptations. Through these collaborative efforts, the projects offered a path to bridge the increasing gap between innovative technology and practical, educational use. It addressed real-world teaching challenges in an effort to enhance student engagement, and support adaptable, scalable solutions for diverse learning contexts.

### 3.2 Development of AR solutions driven by pedagogical, technological, and multiple other principles and innovation

The research teams in each project collaborated on the development of the AR applications where we considered: (a) local and global variables, such as the COVID-19 pandemic in the case of DiMPAH; (b) macro-level and micro-level requirements, such as funding and institutional requirements; (c) identified problems and proposed solutions; (d) the deployment of new technological advances for designing the AR applications; (e) pedagogical needs; (f) access to infrastructure, support, and training in AR technologies. An iterative design process was implemented to design the AR applications, during which instructors, researchers, and an XR developer worked closely to design the AR scenarios. The design and development of the AR proved to be the most demanding and time-consuming process mainly because of the misalignment between the technological and pedagogical conceptualizations of AR. Participating instructors and researchers considered the pedagogical potential, the goals and objectives of the activities, the nature of tasks, as well as interactivity, immersion, and intuitive nature of the scenarios. The software developer, on the other hand, focused on the technical implementation and integration of AR features within the Unity environment, prioritizing aspects such as asset management, scripting, and performance optimization. This included addressing the challenges of rendering 3D models and animations, ensuring seamless user interactions through responsive UI design, and optimizing the AR experience for various Android devices. The XR developer also needed to navigate Unity's ecosystem, utilizing tools like the AR Foundation package for cross-platform support, and implementing realistic interaction mechanics to enhance the immersive experience within the AR environment. However, effective collaboration with the instructional team was critical to align the technical capabilities of Unity with the desired pedagogical outcomes, ensuring that the final product was not only technologically robust but also pedagogically effective and user-friendly. To overcome this contradiction, we proposed a set of guidelines regarding the pedagogical values, tasks, and goals of each scenario. We also collaborated with the XR developer to assess the technological capabilities and constraints of the Unity game engine, and its accessibility on Android devices.

### 3.3 Iterative testing and enhancement of AR applications

To ensure the intuitive nature of the AR scenarios, in both DiMPAH and DIMPE, we invited researchers, students, and experienced teachers to assess them in terms of usability, pedagogical value, technological feasibility, interface simplicity, and operability. An online survey was administered to participants to evaluate the AR scenarios and applications. The feedback received was analyzed and used to address any technical challenges and enhance the quality and pedagogical value of each scenario. Perhaps the most challenging problems that we encountered during this process in both the DiMPAH and the DIMPE projects were (i) students' iOS devices which did not facilitate access to the AR scenarios; (ii) various technological challenges; and (iii) the understanding of AR technologies and their potential. The AR scenarios were designed for Android devices; however, during the implementation process, we discovered that many students had iOS devices. In other instances, students' Android devices either lacked the necessary hardware specifications for AR compatibility or had firewall and security configurations that restricted access to the AR content. To overcome these technical challenges, students were sometimes invited to share devices, while an extra device was also made available to those that needed it. Based on the feedback

 

received, multiple changes were implemented to enhance the quality and nature of the AR scenarios.

### 3.4 Reflection on design-based research and proposal of new novel solutions

Reflecting on our experience in the two projects, the design of AR scenarios for learning considered the following variables: (i) misalignment among researchers in each discipline regarding AR technologies, scenario expectations, and pedagogical-technological needs; (ii) affordances and limitations of game-based engines; and (iii) pedagogical value and nature of task-oriented activities. Consortium members drew on their discipline-related knowledge, which often created contradictions and misunderstandings about the technological and pedagogical value of AR technologies. For instance, the software developer in our team contemplated the technical potential of the game-based engine Unity, while instructors considered the pedagogical value of the activities. Further, the technological affordances and limitations of Unity, development time, and various other contradictions and limitations often inhibited the development process. Finally, the pedagogical value of the AR scenarios, the goals and objectives of the tasks and intended pedagogical value, and implications needed to be considered. This experience underscored the importance of cross-disciplinary collaboration to bridge knowledge gaps and align on shared objectives. Moving forward, addressing these challenges requires integrating feedback loops to refine AR content iteratively. Based on the outcomes, new endeavors can be undertaken by deploying novel technologies that can enhance user engagement and pedagogical impact, while aligning with the diverse expertise within interdisciplinary teams. For instance, artificial intelligence (AI) can be integrated into AR to facilitate adaptive learning by leveraging real-time data analysis and user behavior modeling, creating dynamically personalized and context-sensitive interactions that can enhance user engagement and retention.

## 4 Conclusions

AR solutions for pedagogical purposes require a holistic, interdisciplinary approach to overcome fragmentation among disciplines and transcend boundaries to foster a common understanding and realization of effective AR solutions. As demonstrated by the two projects, Design-based Research (DBR)'s interdisciplinary collaboration is crucial for addressing the complexities of AR development, which include not just technological proficiency but also a deep understanding of pedagogical frameworks. The iterative cycle, continuous refinement, and stakeholder involvement can drive constructive AR solutions and foster a nuanced understanding of the multifaceted processes involved. With advancing technology and evolving global demands, it is essential to commit to rigorous research, collaboration, and innovation, recognizing that the journey to successful AR development and deployment is as complex and emerging as the technology and pedagogical purposes it serves. Additionally, it is vital to ensure that AR solutions remain adaptable to diverse educational contexts, integrating cultural and contextual considerations to maximize relevance and accessibility across varied learning environments and cultural contexts. Moreover, establishing modular frameworks that facilitate easy modification and scalability is crucial for sustainable, long-term implementation. This adaptability ensures that AR applications can evolve alongside educational needs, technological advancements, and the shifting demands of a global, technologically-driven society. Finally, fostering collaboration between educators, technologists, and researchers can create a dynamic ecosystem that can facilitate technological innovative ideas and practical applications. Continuous professional development for educators can form a mechanism for empowerment and effective integration of AR technologies into their teaching practice. Ultimately, embracing a user-centered design framework is crucial to ensure that AR solutions meet the actual needs of learners, enhancing engagement and learning outcomes in diverse educational and cultural settings.

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# Exploring high-variability phonetic training through text-to-speech technology in ESL pronunciation pedagogy

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***Abstract***

*This study investigates the integration of Text-To-Speech (TTS) technology into High-Variability Phonetic Training (HVPT) to enhance pronunciation skills among English as a Second Language (ESL) learners. Addressing one of the limitations of traditional classrooms, in which access to varied speech sounds and accents is restricted, this study explores whether TTS can effectively supplement pronunciation training by providing diverse auditory input outside the classroom, enabling learners to access a wide range of English accents in a semi-autonomous environment. Thirty intermediate-level adult ESL learners from Kuwait participated in a month-long training program. They were divided into an experimental group, which received HVPT with exposure to multiple English accents (varied by region, gender, age) via TTS, and a control group, which used a single TTS voice. Pretest and posttest evaluations assessed changes in pronunciation accentedness and comprehensibility, using a panel of 11 raters. The results revealed that the experimental group showed significant improvements in both accentedness, and comprehensibility compared to the control group. This study highlights the potential of TTS to offer variable aural input to enhance ESL pronunciation training, thus providing valuable insights for developing effective and accessible language learning materials.*

***Keywords:*** *high-variability phonetic training (HVPT); text-to-speech (TTS); second language pronunciation; comprehensibility; accentedness.*

## 1. Introduction

This study explores a novel approach to enhancing pronunciation skills in English as a Second/Foreign Language (ESL henceforth) learners: the integration of Text-To-Speech (TTS) technology within High Variability Phonetic Training (HVPT). HVPT has been widely recognized for its effectiveness in improving phonetic perception and pronunciation proficiency by exposing learners to a diverse range of speech sounds and accents (Bradlow & Bent, 2008; Logan et al., 1991). However, the practical implementation of HVPT in everyday language learning environments remains underexplored, primarily due to constraints such as limited classroom time and access to digital resources (Barriuso & Hayes-Harb, 2018; Thomson, 2018).

TTS technology offers a promising solution to these challenges by providing learners with acoustically varied input, which can be accessed in in-class and out-of-class settings (Cardoso, 2022). TTS synthesizers convert

 

written text into spoken words, allowing learners to access a wide array of accents and voice types (Bione & Cardoso, 2020). This capability aligns with HVPT principles, emphasizing exposure to diverse linguistic input to facilitate phonetic learning, particularly aural perception (Flege, 1999; Moyer, 2009). Moreover, TTS technology can be integrated into self-directed learning environments, thereby extending the reach of pronunciation training beyond the classroom and promoting learner autonomy (Cardoso, 2018, 2022; Kiliçkaya, 2008).

Despite the well-established benefits of HVPT, most empirical research has focused on its application within controlled lab settings (Barriuso & Hayes-Harb, 2018). This has left a gap in our understanding of its effectiveness when implemented in typical learning environments. Additionally, while HVPT has demonstrated success in improving the aural perception and oral production of specific L2 phonemes (e.g., Barriuso & Hayes-Harb, 2018; Thompson, 2018), further research is needed to explore its impact on other measures of L2 pronunciation, particularly those that capture oral communicative competence.

This study aims to fill this gap by investigating the pedagogical effectiveness of TTS-assisted HVPT on ESL learners' pronunciation, focusing on two key aspects of pronunciation: accentedness and comprehensibility. Accentedness indicates the degree to which an L2 speaker's pronunciation deviates from fluent or native speakers' norms. On the other hand, comprehensibility refers to a rater's (listener's) perception of how easily an utterance can be understood. These measures are critical for assessing L2 learners' ability to effectively communicate and be understood by listeners (Munro & Derwing, 1995). By examining how TTS can provide varied linguistic input and improve pronunciation, this study contributes to developing innovative, inclusive pedagogical approaches for language learning. It also addresses the broader implications of integrating technology into language education to support diverse linguistic needs and potentially promote a more effective L2 pedagogy.

Using a mixed-method approach to data collection, this study addressed the following research question:

- Can the integration of HVPT through TTS technology improve ESL learners' pronunciation in terms of:
  a) Accentedness
  b) Comprehensibility

## 2. Method

Thirty adult ESL learners (9 males, 21 females) aged 18-30, residing in Kuwait, were recruited through social media and local academic networks for this study. All participants were native Arabic speakers with intermediate-level English proficiency and no history of speech or hearing disorders. They were randomly assigned to either a treatment group (using HVPT) or a control group, each consisting of 15 participants. Proficiency levels were assessed using a pre-test, a self-assessment questionnaire, and pre-study interviews.

The study was conducted remotely via Zoom and the FlexiQuiz platform over approximately six weeks. As depicted in Figure 1, the methodology included several structured phases. Initially, participants completed demographic surveys and watched a short video briefing them on how to use a TTS tool, Speechify, for pronunciation practice. During the four-week treatment period, each participant engaged in twelve 30-minute self-paced training sessions. These sessions focused on listening activities, including fill-in-the-blank and multiple-choice tasks. Participants listened to given texts and answered comprehension questions, as well as form-focused questions such as "listen to past-ed forms in the text you heard and group them according to how their endings sound." Participants received computer-assisted immediate feedback on each response (via the FlexiQuiz application), following HVPT principles.

 

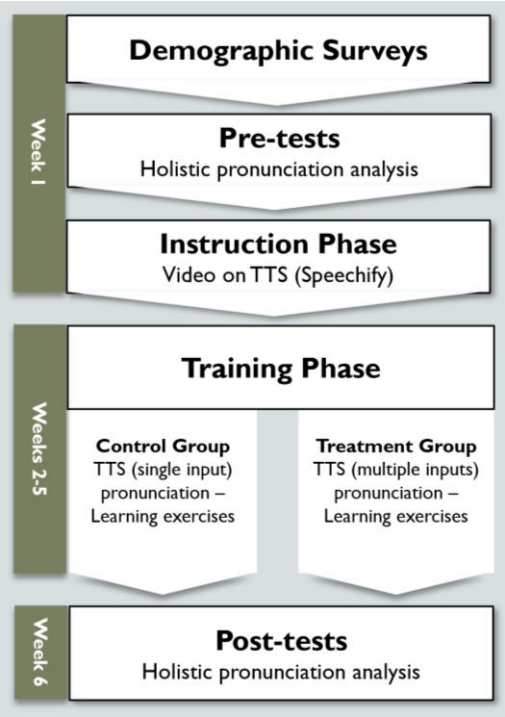


Figure 1. Design of the study.

As detailed in Table 1, the control group received input exclusively from a single synthesized native English accent, while the treatment group was exposed to various English varieties delivered through five different TTS-generated voices, distributed according to region and gender.

**Table 1**. The Distribution of Voices Across the training sessions.

| Treatment Group | | | Control Group | | |
|---|---|---|---|---|---|
| Voice Name | Voice Features | Session No. | Voice Name | Voice Features | Session No. |
| Jamie | North American, Female | 1 and 6 | Jamie | North American, Female | All sessions |
| Micheal | British, Male | 2 and 7 | | | |
| Sydney | Australian, Female | 3 and 8 | | | |
| Nate | North American, Male | 4 and 9 | | | |
| Stephanie | British, Male | 5 and 10 | | | |

Pretests and posttests were conducted to assess participants' pronunciation in terms of comprehensibility and accentedness. To compile data for the raters' assessment, participants engaged in spontaneous speech tasks (e.g., describe activities from a previous summer, describe your last birthday) prior to the treatment (pretest) and after the study (posted). Excerpts of approximately one minute were selected and presented to a panel of eleven experienced ESL teachers who rated these recordings using a 9-point Likert scale. For accentedness, a score of 1 indicated that the rater found the target utterance not accented at all, while a score of 9 indicated an accent that was highly accented. Regarding comprehensibility, a score of 1 indicated that the speech was highly comprehensible, while a score of 9 indicated that it was extremely difficult or impossible to understand. For

 

these two measures, lower scores indicate more favorable outcomes, with speech being easier to understand and not accented at all, respectively.

## 3. Results

We conducted various inferential statistical tests, including the Wilcoxon Signed-Rank Test and the Mann-Whitney U Test, to assess the effects of the treatment on participants' speech. We selected these tests because of the ordinal nature of Likert-scale data and the size of our samples. To control potential Type I errors due to multiple comparisons, we applied the Holm-Bonferroni method for p-value adjustment (*corrected p-value* henceforth). The results are organized into subsections addressing the primary outcomes of accentedness and comprehensibility, providing detailed statistical analyses and interpretations.

As an exploratory measure, we used violin plots to compare pre-treatment and post-treatment ratings (Figure 2) using a bandwidth (bw_method) of 0.3. This parameter controls the smoothness of the kernel density estimate, influencing the appearance of the plot. The plots show a shift towards a lower rating in the ratings distribution of the treatment conditions across accentedness and comprehensibility.

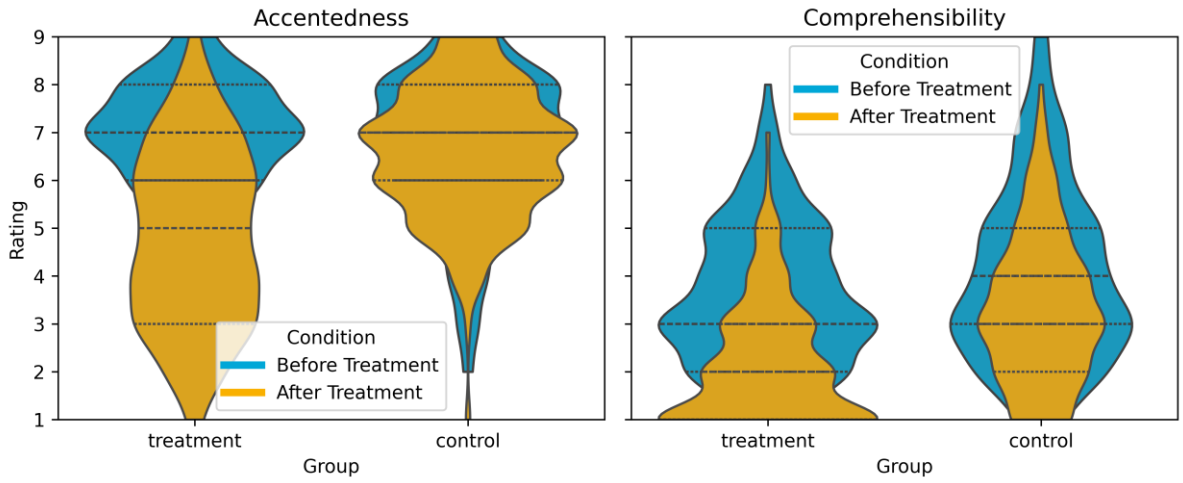


Figure 2. Pre-treatment and Post-treatment Ratings from All Raters by Group.

Before conducting any inferential tests, we assessed the reliability of our raters using the Intraclass Correlation Coefficient (ICC), specifically ICC(3,k). The ICC(3,k) values were 0.9240 (95% CI [0.88, 0.96], p< 0.001) and 0.927; (95% CI [0.88, 0.96], p< 0.001) for accentedness and comprehensibility respectively, suggesting a high degree of agreement among the raters.

### 3.1. Accentedness

For the accentedness ratings, the Wilcoxon ranked-test conducted within the treatment (HVPT) group revealed a test statistic of z = 0.0, and p = 0.0013 (corrected p-value = 0.0027) indicating that speakers' perceived accentedness' was significantly reduced post-treatment. The median score on the 9-point Likert scale item was 5 after completing the treatment compared with 7 before treatment (note that lower scores indicate more favorable outcomes). This was not true for speakers in the control group where the same test indicated no statistical difference before or after treatment, z = 16.0, p = 0.4263 (corrected p-value = 0.4263), with a median score of 7 both before and after treatment.

Comparing the changes in accentedness ratings between the treatment and control groups, the Mann-Whitney U Test indicated that the test group produced significantly less accented speech than the control group, z = 23.5, p = 0.0002 (adjusted to 0.0005), confirming a difference between the groups.

 

### 3.2. Comprehensibility

A signed-rank test indicated that, in the treatment group, speakers' perceived comprehensibility' was improved. This group showed a statistically significant improvement in its comprehensibility ratings after treatment, z = 0.0, p = 0.0028 (corrected p-value=0.0055) with a median rating of 2 after treatment and 3 before treatment. We found no difference for the control group, z = 20.5, p = 0.4584 (with the same corrected p-value) with a median of 3 after treatment and 4 before treatment.

Here, again, the Mann-Whitney U test confirmed a statistical difference between the treatment and the control groups, z = 27.0, p = 0.0002 (corrected to 0.0007), indicating that the experimental (HVPT) group benefited from the treatment more than the control group.

For a comprehensive overview, the statistical results for comprehensibility and accentedness are provided in Table 2. In the table, statistically significant differences are highlighted in bold (recall once again that lower scores indicate more favorable outcomes for the two measures adopted to assess pronunciation).

**Table 2.** Summary of Statistical Results for Accentedness and Comprehensibility Ratings

| Measure | Group | Test statistic (z) | p-value | | Median | |
|---|---|---|---|---|---|---|
| | | | Uncorrected | Corrected | Pre | Post |
| Accentedness | Treatment | 0.0 | 0.0013 | ***0.0027** | 7 | 5 |
| | Control | 16.0 | 0.4263 | 0.4263 | 7 | 7 |
| | Between Groups | 23.5 | 0.0002 | ***0.0005** | - | - |
| Comprehensibility | Treatment | 0.0 | 0.0028 | ***0.0055** | 3 | 2 |
| | Control | 20.5 | 0.4584 | 0.4584 | 4 | 3 |
| | Between Groups | 27.0 | 0.0002 | ***0.0007** | - | - |

## 4. Discussion and Conclusion

The current study evaluated the impact of a TTS-assisted HVPT approach on adult ESL learners' pronunciation, specifically targeting their development in terms of accentedness and comprehensibility. The findings revealed significant improvements in both constructs for the treatment group only. These results are consistent with existing research that underscores the effectiveness of HVPT in enhancing phonetic perception and production (Bradlow & Bent, 2008; Lively et al., 1993; Logan et al., 1991; Thomson, 2018). However, the use of TTS as a medium for delivering varied linguistic input represents a novel application of HVPT, extending its applicability to settings beyond controlled laboratory settings (Thomson, 2018). As our findings indicate, this approach to HVPT demonstrates that TTS can facilitate self-paced, autonomous learning outside classroom environments (Cardoso, 2018; 2022). More importantly, TTS-assisted HVPT practice can help L2 learners develop a more robust and flexible understanding of the L2 sound system, thus contributing to improved pronunciation outcomes, as shown in this study. This type of practice can also prepare learners for the challenges of communicating with different interlocutors in real-life situations. These affordances are particularly important in L2 education, where time constraints and limited access to fluent speakers who can provide diverse speech models are common challenges (Bione & Cardoso, 2020; Collins & Muñoz, 2016).

The significant reduction in accentedness and enhancement of comprehensibility in the treatment group suggest that exposure to a variety of accents and voice types via TTS can effectively improve learners' pronunciation skills. This supports the idea that diverse linguistic input is crucial for developing robust phonetic representations in L2 learners (Flege, 1999; Moyer, 2009). These positive outcomes can be attributed to several factors. First, the diverse range of phonetic cues provided by TTS likely facilitated better phonetic category formation and reduced L1 interference (Flege, 1995), confirming Bione and Cardoso's (2020) assertion that TTS can be a viable alternative for HVPT practice in L2 pronunciation pedagogy. Additionally, the self-paced nature of the training

allowed learners to engage with the material at their own convenience, possibly leading to more effective and sustained learning outcomes. This aligns with claims made about the potential of TTS to promote learner autonomy (Cardoso, 2018, 2022; Kiliçkaya, 2008).

While this study provides evidence for the efficacy of TTS-assisted HVPT, some limitations should be noted. The sample size was relatively small and focused on Arabic-speaking ESL learners in Kuwait, which limits the generalizability of the findings. Future research should include a larger and more diverse sample to validate these results across different linguistic backgrounds. Additionally, examining the long-term effects of HVPT on L2 pronunciation (e.g., via a delayed posted, longitudinal studies) would provide further insights into the sustainability of the observed benefits. In conclusion, this study demonstrates that HVPT assisted by TTS technology can improve L2 learners' pronunciation skills in terms of accentedness and comprehensibility. These findings contribute to the growing body of literature on the use of technology in language learning by highlighting the potential of TTS-assisted HVPT to enhance L2 pronunciation development.

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# Exploring the interplay between WhatsApp and reflective journals in telecollaborative projects

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***Abstract***

*Telecollaboration has become a growing pedagogical tool in language science, as it facilitates the development of linguistic, cultural, and intercultural communicative competencies. Many telecollaborative projects have incorporated videoconferencing platforms such as Skype, Snapchat, and Zoom, among others for cross-cultural communication; however, there is now a growing interest into the affordances of mobile instant messaging platform WhatsApp for telecollaborative purposes. Notwithstanding, the data is currently limited. Furthermore, while reflection is a common aspect of telecollaboration, very limited studies have assessed the interplay between WhatsApp and the systematic completion of learning journals. This present study aims to bridge the gap by reporting on phase 3 of ClerKing – a 10-week telecollaborative project which occurred between Applied Foreign Languages students of English from Clermont Auvergne University, France and Modern Languages students of French from the University of the West Indies, Mona, Jamaica. Data was collected via pre and post-project questionnaires and learning and reflective journals and analysed through exploratory context analysis. Preliminary findings suggest that WhatsApp is ideal for telecollaboration because of its features, accessibility, and practicality. The platform primarily facilitates the development of vocabulary and grammar, and it helps students to document potential learning sequences in their learning journals, which promotes metacognition.*

***Keywords:*** *WhatsApp; reflective journal; intercultural communicative competence; telecollaboration; ClerKing.*

## 1. Introduction

As the world becomes more interconnected, there is even greater need for students to develop their intercultural communicative competencies (ICC). Although some students have the opportunity to travel abroad as part of student mobility or work and travel programmes, which allow them to interact with people of different languages and cultures, the majority remain in their home countries throughout their entire undergraduate years. However, advances in information and communication technologies (ICT) allow institutions worldwide to collaborate in order to have students share with and learn from each other (Emezirinwune et al., 2024). Telecollaboration is a pedagogical tool which can facilitate such interactions. Di Sarno-García (2023) describes telecollaboration as the process by which language learners from two (or more) different institutions collaborate online to improve their linguistic, social, communicative, and intercultural skills. Dooly (2017) adds that these learners work together "from different locations through online or digital communication tools (e.g., computer, tablets, and cellphones) to co-produce a desired work output". In addition, telecollaboration focuses on "learning, social interaction,

 

dialogue, intercultural exchange and communication, all of which are especially important aspects of telecollaboration in language education" (Dooly, 2017, pp. 169-170).

Many factors influence the outcome of telecollaborative projects, including the choice of communication platform. WhatsApp as a tool for communication and collaboration between students and teachers is a growing trend that has been identified in educational research (Nasution & Munandar, 2023). Likewise, WhatsApp has been gaining traction in the context of telecollaboration and mobile-assisted language learning (MALL). It is one of the most widely used mobile instant messaging (MIM) applications that allows users to utilise a number of features, such as sending text, voice, and video messages, making (group) voice and video calls, and sharing different types of media and documents in real time. For this reason, Madden and Foucher (2020) describe WhatsApp as a "practical, popular, and preferable" platform, which can help with second language (L2) development, as it allows for "potential learning sequences on different levels: linguistic, cultural, and intercultural" (p. 206) and it does not require much cognitive manipulation. Researchers continue to investigate the individual and socio-pedagogical benefits of WhatsApp; however, as Takkac Tulgar (2019) highlighted, there is limited literature on "the possible contributions of WhatsApp as a platform for cultural interaction in a glocal sense" (p. 17).

Additionally, there is insufficient research that addresses the interplay between WhatsApp and reflective journal entries in telecollaboration. Several telecollaborative projects have invited students to reflect on their perceptions of intercultural exchanges and their linguistic, cultural, and intercultural takeaways, after communicating via platforms such as Skype and Zoom, as well as other customised applications (Batunan et al., 2024; Emir & Yangın-Ekşi, 2024). However, very little is known concerning students' systematic use of WhatsApp and completion of structured reflective learning journal entries. Madden and Foucher (2020) found that when multiple communication platforms are proposed, WhatsApp is prioritised, which makes it easier to document learning experiences. A useful feature of WhatsApp is that "it helps users to select and respond to specific messages instead of searching through a pile of messages" (Madden & Foucher, 2020, p. 205). Nevertheless, more research is required to unlock the interrelation between WhatsApp and learning journals in telecollaboration.

To examine this phenomenon, this research employs the exploratory content analysis approach to understand the relationship between WhatsApp and learning journals in telecollaboration. The following questions are used to guide the study:

1. What are students' perceptions of the incorporation of WhatsApp in telecollaborative projects?
2. To what extent does WhatsApp impact students' completion of learning journals?

## 2. Literature Review

### 2.1 Use of WhatsApp in telecollaborative projects

Numerous studies have shown that many university students and teachers use WhatsApp groups for academic objectives (Baishya & Maheshwari, 2019). Researchers such as Madden (2022) and Takkac Tulgar (2019) have demonstrated how WhatsApp has been used to connect cultures and improve intercultural, linguistic, and pragmatic competence through telecollaboration. Other studies have demonstrated that social media communication platforms like WhatsApp have been varying in their use as language learning tools and have yielded promising and beneficial results for both language learners and teachers (Kartal, 2019; Khan et al., 2021; Syairofi et al., 2023). Khan et al. (2021), who explored the attitude of learners when the application is integrated into vocabulary development of English language learners, found that learners demonstrated a favourable outlook regarding its use. The results indicated that learners found the application to be ideal, as it makes learning attractive. They were able to relay vocabulary information easily through the app and it became the perfect source of interaction and vocabulary building in the target language. Similarly, in Kartal's (2019) study, WhatsApp was found useful in improving language skills, in addition to its effectiveness in increasing motivation, catering to the learners' independence and reducing anxiety – a common language learning deterrent. Syairofi et al. (2023), looking into the use of WhatsApp to assist English language learners, realised that the application was more commonly used to share materials, start discussions, engage in questions and answers, and talk about feedback

 

from instructors. Rokhmah (2019) indicated that the use of digital media such as Facebook and WhatsApp helps students to engage in learning outside of the regular school hours, which fosters development in students' vocabulary and overall competency in a target language and motivate students to use the target language to chat, give comments, and make status updates on social media.

### 2.2 Reflection in telecollaboration

Concerning reflective journaling in telecollaboration, it is not a widely investigated area. Although, based on the nature of it, it is useful and crucial for both language learners and their instructors to practise same, which will unequivocally inform the development of language teaching and learning using the virtual exchange method/approach. Based on the literature, many telecollaborative projects have invited students to do a summative evaluation of their overall impressions of and gains from online virtual exchanges, but very few mention systematic journal entries. Fuchs (2015) stated that "telecollaboration learning log entries can serve the purpose of shedding more light on on-going communication and negotiation difficulties and challenges that teams may encounter during their telecollaboration." Furstenberg and Levet (2010) suggested that participants could be asked to reflect regularly on their telecollaborative processes in weekly logs by filling out multiple choice and open-ended questions with the aim to evaluate their group work processes within both their local and international telecollaborative groups. In addition, Fuchs (2015) recommended that participants could be asked to identify a learning moment item (or potential learning sequence (PLS), Madden et al., 2021) for each week in an area that they have come across in their interactions with their telecollaborative partners. PLS could be a language-related item, and/or a cross-cultural or pragmatic mishap. This approach supports Fink's (2013) call, encouraging self-directed learning by having students "think toward the future and identify what else they need or want to learn, that is develop a learning agenda" (p.160). In addition, Dooly (2008) proposed that students could comment on the the evolvement of their virtual communities (VCs) of practice in their log entries by rating their VCs' progress on a scale with qualitative comments indicating areas for improvement. Still, a gap exists between telecollaborative pedagogical scenarios that incorporate both WhatsApp and learning and reflective journals, especially as many students use WhatsApp for private reasons (So, 2016).

## 3. Method

This study reports on Phase 3 of ClerKing – a telecollaborative project that occurred between Applied Foreign Language learners of English from Clermont Auvergne University (UCA), France and learners of French from the University of the West Indies, Mona, Jamaica. Twenty-six learners (21 F, 5 M) worked in pairs during a 10-week semester to discuss cultural and intercultural themes, such as multiculturalism, stereotypes, regional languages, taboos, etc, in both French and English, using WhatsApp and other videoconferencing platforms, to improve or develop their linguistic, cultural and intercultural skills in the target language and culture studied. Clermontois students were between B2-C2 in English according to the Common European Framework of Reference for languages (CEFR) scale, while Jamaican students were between B1-B2 level in French. Their language proficieny was assessed prior to them taking their respective courses, namely Open Learning Project for UCA students and French Language IIIA for the Jamaican students. After each weekly exchange, students completed a journal entry to document their linguistic, cultural, and intercultural gains, and evaluated their level and type of participation. This data was complemented by a summative reflective journal and a pre and post-questionnaire that explored different elements of the project.

The exploratory qualitative content analysis approach is used to analyse the data to provide insights into the interplay between WhatsApp and journal entries in telecollaboration. As limited information exists into this correlation, the exploratory approach seeks to gain preliminary insights into this phenomenon. Graneheim and Lundman (2004) indicate that the exploratory approach identifies 'meaning units' across participants and aims to 'condense' the verbatim into manageable units without losing the essence of the message. This can be done through citing specific examples.

 

## 4. Results

Of the 26 students who participated in the project, 19 of them responded to the post-project questionnaire. As seen in Table 1 below, students prioritised videoconferencing platforms such as Skype (N=13) and Zoom (N=5) for voice and video calls.

**Table 1**. Students' usage of videoconferencing platforms for voice and video calls during ClerKing

| | **Skype** | **Zoom** | **Instagram** | **Snapchat** | **Discord** | **WhatsApp** |
|---|---|---|---|---|---|---|
| Number of students | 13 | 5 | 2 | 1 | 1 | 1 |

Concerning WhatsApp (see Figure 1), it was used primarily for text-based (N=18) conversation and voice-messaging (N=11), while a minority used voice call (N=4) and videocall (N=2). As seen in Table 2, text was "very regularly" used by the majority of the respondents (N=11) and "regulary used" by the others (N=8). With regard to voice message, this feature was "very regularly" used by a insignificant number (N=1), "regularly" used by (N=2), "faily regularly" used by (N=9), and "never" used by (N=7). The majority of respondents indicated that they "never" used voice call (N=12) nor videocall (N=10).

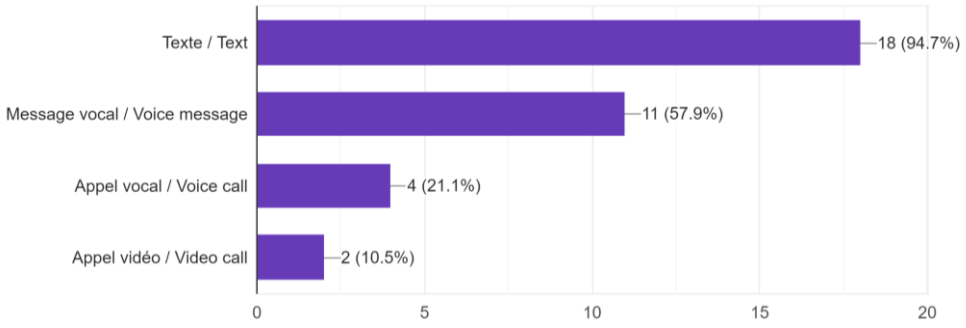


Figure 1. Students' usage of WhatsApp features during phase 3 of the ClerKing telecollaborative project

**Table 2.** Frequency of students' usage of WhatsApp features during phase 3 of the ClerKing telecollaborative project

| **Type of communication** | **Very regularly** | **Regularly** | **Faily regularly** | **Never** |
|---|---|---|---|---|
| Text | 11 | 8 | 0 | 0 |
| Voice message | 1 | 2 | 9 | 7 |
| Voice call | 0 | 2 | 5 | 12 |
| Video call | 1 | 0 | 8 | 10 |

All the respondents (N=19) indicated that WhatsApp is an appropriate communication platform for telecollaborative projects because of its different functionalities, practicality, and accessibility, as mentioned in some of these excerpts (see Table 3) taken from the post-project questionnaires.

**Table 3**. Students' self-reported perceptions of WhatsApp for telecollaborative projects

| | |
|---|---|
| **Participant 1** | "I think that WhatsApp is suitable because of its multiple features." |
| **Participant** 2 | "I think it's a good idea, because in my case for example WhatsApp is the app I use the most for communication and I find it so easy to use and you can do anything you want." |
| **Participant** 3 | "It's great because, like other communication devices, it has a lot going for it. The difference is that WhatsApp is more suitable for use on a mobile phone." |
| **Participant** 4 | "It's a pretty versatile application with lots of different features and few bugs in general, and one that a lot of people already use on a daily basis, so I think it's a good choice." |
| **Participant** 5 | "I think it was a good choice because WhatsApp offers a lot of different features that allow you to communicate in the way you want." |
| **Participant** 6 | "It was effective as WhatsApp is usually installed on everyone's cell phone, making it very accessible and convenient for communication at any given point in time." |

In line with the frequency with which students used different WhatsApp communication features (Table 2 above), the choice of WhatsApp as a communication tool in telecollaborative projects facilitates the systematic completion of learning journals in documenting potential learning sequences (PLS). All the participants reported linguistic, cultural, and intercultural gains in their weekly learning journals. As seen in the Appendix , the structure of the learning journal required students to respond to the question 'What did I learn this week?'. Table 4 below provides examples of gains recorded by four students based on discussions on the topic 'Customs/Stereotypes'.

**Table 4**. Examples of students' self-reported gains via their learning journal entry

| Type of conversation | Linguistic gains | Cultural/intercultural gains |
|---|---|---|
| **Text** | Expression "first-hand", the context was that people sometimes stereotype because they don't know anything about the culture or the lifestyle of the country they are stereotyping, they have never seen it first-hand. | We also talked about Jamaican stereotypes like for example: People with white skin and that speak properly = wealthy person or "Rastas" = bad people that do not behave and only look for trouble, and those are not necessarily truth. |
| **Voice message** | To be accustomed to a culture<br>'Cuisine' as a word for food, gastronomy<br>Having a hoarse | Gender stereotype: see a guy with something weird, not accustomed to-> think that he has a different belief, he may be homosexual (wear a certain colour like pink, yellow…). Same for woman with "men clothes" |
| **Text** | I learnt the expressions 'faire la bise' and 'la fête du travail' | … I used to think that all French people were snobs, but my partner said that's not quite true, but most people in big cities behave like that. She also said that French food isn't bland; it's very tasty and delicious, but it's not very spicy. I also learnt that when it comes to greetings, you should always be polite and shake hands if necessary. But when it's someone you know very well, you kiss on the cheek… |
| **Video call** | Sometimes I used to say 'rendre au/un visite', but this was corrected by my | She debunked the myth that the French put their fingers in the Camembert before buying it in the |

| | | |
|---|---|---|
| | partner. She said that we say 'rendre visite à' | supermarket. She also said that the French are only violent when they fight for their rights. |

## 5. Discussion

The findings suggest that students have a positive perception on the inclusion of WhatsApp in telecollaborative projects, especially due to its numerous features, which allow students to communicate via text, voice call, voice message, or video call. Students also appreciate that WhatsApp is accessible and practical. Most students download WhatsApp on their smartphones, which is portable; therefore, it gives them the flexibility to utilise an appropriate communication feature to exchange with their partners while travelling. This supports the position of Madden and Foucher (2020) that the MIM platform is practical, popular, and preferable, especially as a growing number of university students and instructors have started to use the social network for academic objectives (Baishya & Maheshwari, 2019). In this phase of ClerKing, the two main WhatsApp features used were text and voice message, while videoconferencing platforms such as Skype and Zoom were employed for lengthier video conversations. This indicates that WhatsApp text primarily has the potential to develop learners' writing skills (Rokhmah, 2019), including vocabulary and syntactic development and reinforcement, while videoconferencing allows for oral, spontaneous practice and development and for in-depth exchanges and the development of intercultural communicative competence (Tecedor & Vasseur, 2020). Notwithstanding, the depth of gains achieved by students is heavily dependent on individual, pair, or group engagement, irrespective of the platforms used.

WhatsApp is also a pragmatic platform in telecollaborative projects to help complete systematic learning journals. Learners are able to document their experiences in a meaningful and reflective way, being able to extract specific data from their WhatsApp conversations to include in their journals. Madden and Foucher (2020) alluded to WhatsApp allowing users to select specific messages by inserting key words, instead of searching through a pile of messages. Importantly also, it is crucial to have students reflect regularly in telecollaborative projects. However, even though Furstenberg and Levet (2010) suggested weekly reflections, instructors may want to evaluate its practicality, considering participants' workload and other socio-institutional issues that may affect their completion. Nonetheless, as Fuch (2015) and Madden et al. (2021) recommended, it is useful to ask participants to identify potential learning sequences (PLS) or learning moments, which also help to develop their metacognitive skills. Madden et al. (2021) noted that metacognition could occur in the form of "self-correcting and self-assessing, accommodating new knowledge through reflection, and examining how one processes thoughts and feelings" (p. 208). Interestingly, the cultural and intercultural representations of the target culture that participants leave with are notably based on the types and depth of conversations had with their partners. This is because students often share information from their own lived experiences, personal biases, and interpretations of their own countries' cultures and values. Consequently, participants in telecollaborative projects should be encouraged to take their inquiries beyond the scope of the project to broaden their perspectives.

## 6. Conclusions

The study evaluated students' perceptions of the incorporation of WhatsApp into telecollaborative projects and the interplay between WhatsApp and the completion of learning journals. Major findings reveal that all the participants welcomed the integration of WhatsApp because of its affordances, such as its features – being able to use text and voice message and voice and video call – and its practicality, accessibility, and flexibility. WhatsApp is primarily used for text-based conversations, which contributes to the development and reinforcement of vocabulary and grammar, while Skype and Zoom are mostly used for longer discussions, which mainly facilitate the development of intercultural communicative competence and strengthen speaking skills and build confidence. WhatsApp also helps with the systematic completion of learning journals, once a consistent structure is established. Journals help students to reflect on their learning experience and document gains, challenges, and interests.

 

However, instructors should carefully think about the volume of information students are required to produce and the amount of time invested, especially if telecollaborative projects are done outside of the scheduled class time.

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## Appendix

| | |
|---|---|
| **Type of communication done this week: call, text, video, photo**<br><br>**Type de communication faite cette semaine : appel, texte, vidéo, image** | Text Messages |
| What did I learn this week?<br><br>Qu'est-ce que j'ai appris cette semaine ? | **Language / Langue :**<br>**(grammatical point(s) / point(s) de grammaire, new vocabulary / nouveau vocabulaire / new expressions / nouvelles expressions, etc.) (Donne le contexte dans lequel l'élément a été employé / Give the context in which the element was used).**<br><br>« to be in a bind »<br>Polling day (when we talked about the time of the elections)<br><br>**Culture :**<br>**(This also includes: attitude, behaviour, beliefs, values, etc. / Cela inclut également : l'attitude, le comportement, les croyances, les valeurs, etc.) (Donne le contexte dans lequel l'élément a été employé / Give the context in which the element was used).**<br><br>Jamaica is a democratic government, and the prime minister is at the head of the country<br>Two political parties : Jamaica Labor Party (JLP) and People's National Party (PNP)<br>JLP's colo ris green to symbolize peace, PNP's color is orange and the symbol of the party is a fist.<br>During the elections : a bell is used to represent the JLP and a head to represent the PNP, and people are dressed according to the color of the party they vote for |

 

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# Exposing Francophone students to Jamaican language and culture: Reflections from the ClerKing telecollaborative project

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***Abstract***

*Jamaican Creole (JC) is a popular language spoken by a majority of Jamaicans both locally and in the Diaspora. However, it is still a language that is unfamiliar to many foreigners, though the small country is known internationally for its music, food, culture, dominance in sports, as the people are "likkle but tallawah". In a decade in which the United Nations is celebrating indigenous languages it is an opportune time to promote and expose international students to JC. This study reports on an initial exposure to JC in phase 3 of ClerKing (Clermont-Ferrand-Kingston) – a ten-week telecollaborative project which brought together learners of English from Clermont Auvergne University (UCA), France, and learners of French from the University of the West Indies (UWI), Mona, Jamaica. WhatsApp and videoconferencing platforms were used to discuss cultural and intercultural topics, including JC. Using the exploratory approach, we seek to ascertain French students' perceptions on being exposed to Jamaica and the JC. Preliminary findings suggest that French students learnt and practised basic JC structures and vocabulary and had a deep appreciation for the exposure. This broadened their appetite of wanting to learn more about and eventually visit Jamaica.*

***Keywords:*** *Jamaica; Jamaican Creole; telecollaboration; ClerKing; intercultural competence; WhatsApp.*

## 1. Introduction

Jamaica is admired internationally because of its dominance in sports, its rich musical history, especially reggae and dancehall, its diverse cuisine and vibrant culture, as well as its beautiful beaches. However, outside of these representations held by many Europeans, a very critical part of the country's tapestry is less known or often ignored – the local language: Jamaican Creole (JC) or Jamaican Patwah. JC is an English-based creole language which has its roots in several West African and Romance languages. It started as a pidgin during the time of slavery in the 17th century. Most of the non-English loan words are of Akan Ashanti origin as it is an amalgam of the languages spoken by two or more groups of people that came into contact. In addition, JC exists on a continuum, ranging from more similar to less dissimilar in English (Davidson & Schwartz, 1995). Patrick (2019) categorises the different levels as acrolect (variations which are closest to English), basilect (variations which are furthest from

 

English) and the mesolect (variations which are in between). An example of each category is shown in Table 1 below.

**Table 1.** Different translations of 'I am eating the food that they gave me' in Jamaican Creole (Armstrong et al., 2022)

| **Category** | **Example** |
|---|---|
| Basilect | Me a nyam di bickle weh dem gi mi. |
| Mesolect | Me a eat di food weh dem gi mi. |
| Acrolect | I'm eating the food that they gave me. |

JC is a largely spoken language, mastered by over three million people living in Jamaica and the Diaspora. Many creole linguists have considered it as a language and not just a dialect, and numerous efforts have been made by the Jamaican Language Unit at the University of the West Indies, Mona, Jamaica, to develop a formal writing system. However, none of the proposed orthographic systems have been widely used by the speakers of the language. Instead, Jamaican creolophones employ spelling patterns that reflect the phonology of Patwa, which create several variations. Nevertheless, these variations do not necessarily create a communication or comprehension barrier among the locals when speaking but there may be challenges when reading. The Cassidy model is often employed in formal publications, such as in the translation of *Di Jamiekan Nyuu Testament* (The Jamaican New Testament).

JC is one of over 100 creole languages spoken by millions of people across different regions globally. Although there has been growing interest in Less Commonly Taught Languages (LCTL), creoles, including JC, are significantly under-explored despite their growing usage and popularity globally (Lent et al., 2022). In addition to studying Jamaica's sport and cultural icons, a growing number of British and American universities, including Harvard University, have taken interest in the Jamaican language. Some of them have even upgraded their curricula to offer courses in JC up to the advanced level. However, there is still much work to be done to spread awareness and to introduce this language in different spheres of the world. This supports a United Nations General Assembly policy which proclaimed 2022 to 2032 as the International Decade of Indigenous Languages. The aim is "to draw global attention to the critical situation of many indigenous languages and to mobilise stakeholders and resources for their preservation, revitalisation, and promotion" (UNESCO, 2023). Foreign language educators play a critical role in designing pedagogical scenarios in response to this mandate. Telecollaboration is a practical way to achieve this, as it connects learners from different geographical locations in an online setting in which they complete different collaborative tasks with the aim of strengthening their linguistic, cultural, and intercultural competencies in the target language studied.

With ClerKing being a pioneering telecollaborative project of its nature between Jamaica and France, the authors seek to examine the main linguistic and cultural takeaways from the sessions done on Jamaica and JC and to document French students' perceptions on the Jamaican language and culture after their exposure. The qualitative exploratory approach will guide this study, which forms part of a larger doctoral research in language sciences. The study is directed by the following research questions:

1. What are French students' perceptions of Jamaica and Jamaican Creole?
2. To what extent does ClerKing foster the development of cultural competence?

## 2. Literature Review

Exploring the promotion of Less Commonly Taught Languages (LCTLs) through telecollaboration offers valuable insights into innovative educational practices and the potential for cross-cultural engagement in language learning. The National Council of Less Commonly Taught Languages (n.d.) defines LCTLs as any language other than English and the commonly taught European languages of Spanish, French, and German. They are also seen as

languages that are "considered important by the government, but unsustainable by the market" (Gor & Vatz, 2009, p. 234). Several strategies have been made to preserve and promote LCTLs like creoles; one such strategy is telecollaboration, which "in foreign language education is online intercultural exchange between classes of students in geographically distant locations" (Anikina et al., 2015, p. 156). Telecollaboration has emerged as a pivotal method for fostering cultural competence among foreign language learners, providing opportunities for authentic cultural interactions beyond traditional classroom settings. According to Rew et al. (2003, p. 250), "when individuals are conscious that people are different from one another, partly because of their cultural backgrounds, they are culturally aware". This leads to greater understanding and more effective cross-cultural communication.

Once the challenges associated with telecollaboration are dealt with, such as lack of time among teachers and students, lack of motivation among some students, absence of institutional support, tech issues including access, lack of pedagogic training, and difficulty obtaining a partner group for the collaboration (Helm, 2015), the benefits of telecollaboration can be fully realised. Language learners who participate in telecollaboration develop language skills, ICC, new online literacy, language tutoring skills, and work-related competences since it offers learners an authentic context for taking part in a real communication, which is often lacking in the classroom (Anikina et al., 2015). It has also been demonstrated that pragmatic skills, which are crucial in communication, are developed through telecollaborative activities (Montaner-Villalba et al., 2022, p. 290).

Anikina et al. (2015) integrated telecollaboration in their Lingua Exchange 2015 project among students from Tomsk Polytechnic University (Russia), University of Arizona (Arizona, USA), and Loyola University (Chicago, USA), which sought to promote greater contact between the students so that they could develop their foreign language skills and ICC. Anikina et al. (2015) concluded that the project led to these results: "increasing learners' motivation in language acquisition, breaking the language barrier, increasing students' cultural awareness, enriching vocabulary, [and] developing language skills" (p. 161).

With the increased integration of telecollaboration in computer-assisted language learning and LCTL promotion, resource challenges, such as the lack of access to language and technological resources could be remedied (Ward, 2018), as a number of studies have shown the potential of telecollaboration to promote LCTLs. One example is a study by Klimanova and Dembovskaya (2013) in which English-speaking American students were connected with Russian native speakers living in the United States and abroad in Russia. The telecollaborative task-based exchanges among the students spanned two semesters on VKontakte, a Russia-based counterpart to Facebook. The findings revealed that students were involved in: error correction, either solicited or volunteered; establishing close relationships; exchanging information; completing project assignments; and re-claiming their cultural identities. In addition, Wang et al. (2013) used the wiki platform to underscore the promise of telecollaboration in promoting LCTLs. Their study was designed and implemented in a degree course of Business Chinese in the academic year 2010–2011 at the University of Manchester, United Kingdom. The course was designed to strengthen English-speaking students' Chinese language and ICC. The results of the study showed the telecollaborative project's success in providing peer mentoring, professional development, and authentic input from native speakers. Furthermore, preliminary findings from Madden et al. (2021) showed that telecollaborative efforts to teach Jamaican Creole could result in vocabulary and syntax development, culture-specific knowledge, and negotiation of meaning. Clearly, telecollaboration is crucial for the maintenance and promotion of cultural and linguistic diversity; it is "not an optional add-on, but an inevitable survival strategy" (Godwin-Jones, 2019, p. 17).

Similarly, tandem telecollaboration also has benefits for LCTL. Dey-Plissonneau et al. (2022) note that tandem telecollaboration is a pedagogy used in L2 learning, "where mixed groups of students meet online in videoconferencing sessions to practice their conversational skills in their target language" (p.1) and become actively engaged in their learning process. Topal (2024) states that tandem promotes "the development of inclusive learning communities, facilitating intellectual exchanges and knowledge co-constructions across boundaries" (p. 1). Elo and Pörn (2021) propose the tandem learning methodody, which mirrors natural language acquisition, by introducing learners to authentic language scenarios. Consequently, learners partake in common language learning and practice which result in exchanges that are mutually beneficial.

 

Telecollaboration's transformative role in education is evident in its ability to democratise intercultural experiences by transcending geographical barriers and offering cost-effective cultural immersion. Üzüm et al. (2020) emphasize its benefits in promoting critical cultural awareness and engaging learners in discussions that challenge cultural preconceptions. Although it has its drawbacks, telecollaboration holds promise in cultivating global competencies and preparing learners for global communication by facilitating nuanced understanding of cultural diversity and promoting openness to otherness.

## 3. Method

ClerKing – the portmanteau of Clermont-Ferrand, France and Kingston, Jamaica – is a telecollaborative project that occurred in different phases between university students learning either English or French. Building on the work of Madden and Ashby (2021), this study reports on Phase 3 of the Franco-Jamaican project between Applied Foreign Langugaes students of English from Clermont Auvergne University (UCA) and modern languages majors from the University of the West Indies (UWI), Mona. The project was administered during a ten-week semester between 26 students (21 female, 5 male), who were paired equally (one Clermontois to one Jamaican) according to their profiles submitted before the start of the project. The primary aims of this project were for students to practise the target language studied and to develop and/or improve their language skills and cultural and intercultural awareness in said language, based on their individual language levels. Clermontois students were B2-C2 in English on the Common European Framework of Reference for Languages scale, while Jamaican students had a B1-B2 level in French. Each week, students discussed different cultural and intercultural topics with the help of a discussion guide (for instance, regional languages, cultural taboos, customs, stereotypes, education system, geopolitics, peer pressure, multiculturalism) via multimodal platforms such as WhatsApp, Skype, and Zoom.

The data collection for this study consisted of learning journals, completed at the end of weekly conversations, and reflective journals completed at the end of the project, as well as two questionnaires – one completed at the start of the project, which gathered information on the participants' biographies, linguistic competences, usage of communication tools, and exposure to telecollaboration and intercultural communication, and the other completed at the end of the project, which examined students' participation in and perceived gains from the telecollaborative project.

## 4. Results

### 4.1 Perceptions of Jamaica

In the pre-project questionnaire, Clermontois students were asked to state what Jamaica represented for them. A majority of them admitted to knowing very little about the island but gave a range of perceptions (see Table 2), which include peace, a tropical environment, different cultural, sport and musical icons, flora and fauna, and a country rich in culture and history.

**Table 2**. Excerpts from French students' self-reported pre-project perceptions of Jamaica

| | |
|---|---|
| **Participant 1** | "Jamaica represents summer, festivity, joy, a bit of a postcard setting, with an interesting culture (historical as well as culinary, etc)." |
| **Participant 2** | "For me, Jamaica is a happy and welcoming country, with its traditions, customs and the mentality of its people." |
| **Participant 3** | "When I hear Jamaica for the first time, I think about Bob Marley, sunny tropical beaches, weed (even if I don't smoke)." |

 

| | |
|---|---|
| **Participant 4** | "For me, Jamaica is an island full of natural riches (flora). It's a happy country from a cultural point of view (music…). This country is still unknown to me, but I hope to learn more about it during this semester thanks to my partner." |

At the end of the project, students evaluated their initial perceptions of Jamaica. Some of the same elements resurfaced as seen in Table 2; however, there were discoveries in terms of social conditions, values, and multiculturalism (see Table 3).

**Table 3**. Excerpts from French students' self-reported post-project perceptions of Jamaica

| | |
|---|---|
| **Participant 1** | "Jamaica is a very cultural country with lots of events and celebrations, but there is still a lot of conflict within the population." |
| **Participant 2** | "A country with a festive population, significant natural resources and a very rich history, but a country that is fairly poor and socially divided." |
| **Participant 3** | "It seems [to be] a beautiful country with lively people, and thanks to this project I wish one day I will have the chance of visiting Jamaica and seeing all that beauty by myself." |
| **Participant 4** | "I don't see Jamaica how I saw [it] before the project. Happy to visit Jamaica soon." |
| **Participant 5** | "…with the activities done in class, I learnt a lot about the history of Jamaica and why Jamaicans act the way they do, the pride of the country, the hospitality of their culture, etc." |
| **Participant 6** | "I have a beautiful perception. Jamaica is a country full of values." |

This is supported by further examples given in the post-project questionnaire concerning cultural gains.

**Excerpt** 1: **"**Jamaica celebrates many things, and religion is an important part of politics and culture in general.**"**

**Excerpt 2**: "I learned about the Jamaican Creole, about their customs too like the wearing of clothes with the colors of the Jamaican flag for the Independence Day, etc."

**Excerpt 3**: "In France, we don't know much about Jamaican culture, so this enabled me to learn more about it, such as the fact that they are practically all Christians."

As indicated in their reflexive journal entry, these exchanges have allowed students "to remove the clichés" they had on Jamaica and "to come out with a beautiful vision of Jamaica and its inhabitants." One student summarised the experience like this: "The exchanges allowed me to develop my general culture by learning new things about a country and a culture that I barely knew before that." Additionally, "they allowed me to realise how wonderful the Jamaican culture is, that Jamaicans try to be happy and happy in all circumstances, which makes me put a lot into perspective."

### 4.2 Perceptions and gains on Jamaican Creole

All the students noted gains from their initiation to JC through both their class sessions and interactions with their Jamaican/Caribbean partner. They all made a list of some of the basic vocabularies and expressions used in JC in their learning journals (see Figure 1 for examples), such as greetings, phrases to introduce oneself, and other typical question-and-response structures.

 

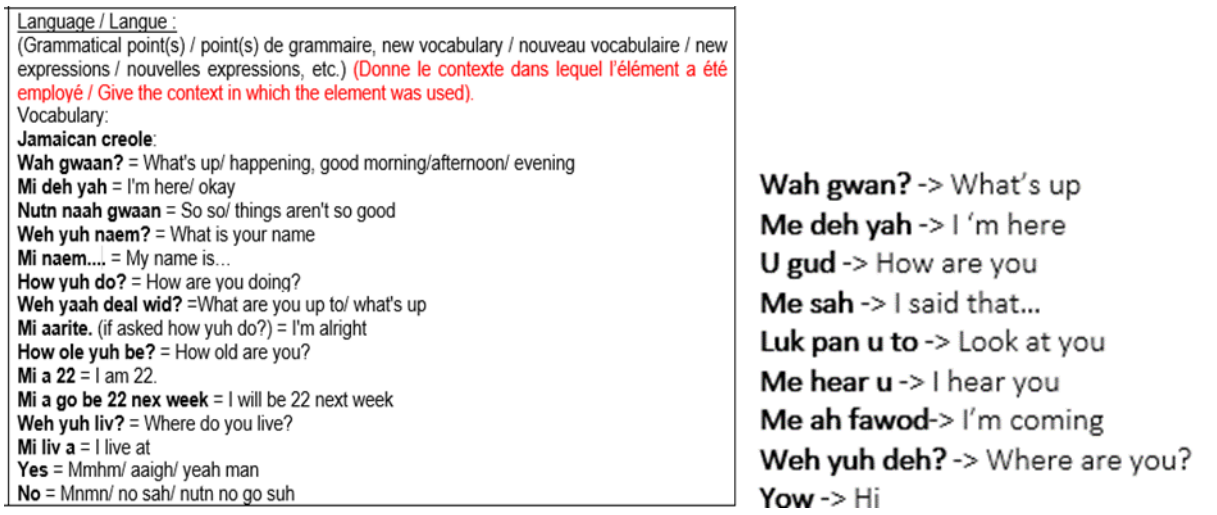


Figure 1. Examples of Jamaican Patwa words/expressions learnt by French students

Additionally, all the students expressed appreciation for the exposure to the Jamaican language. Even though none of them had travelled to Jamaica before the telecollaborative experience allowed them to have a mental connection to the country. This led to them learning authentic information and becoming more open-minded (see Table 4).

**Table 4**. French students' self-declared appreciation for exposure to the Jamaican culture and language

| | |
|---|---|
| **Participant 1** | "Learning with a native speaker is also a great way to get authentic expressions, slang, accent, sentence structures, cultural references that will help you have a more fluid and authentic language." |
| **Participant 2** | "I have never travelled abroad in my life and I discovered many things speaking with my partner. This is motivating me to reach out to even more people from many other countries and to learn about them and their culture." |
| **Participant 3** | "I even got to learn a bit of creole and speak it a little, which I found very fun." |
| **Participant 4** | "As a student that didn't travel a lot and still doesn't have the chance to travel, I definitely travelled in Jamaica in my mind." |

## 5. Discussion

Telecollaboration is a useful pedagogical tool that can be used to learn and promote less commonly taught langugages (Ward, 2018). As seen in the ClerKing project, all the Clermontois students indicated that they gained linguistic and cultural insights about Jamaica and the JC. This supports previous studies done by Madden and Foucher (2020), Madden et al. (2021), and Anikina et al. (2015) that telecollaboration provides opportunities for learners to gain culture-specific knowledge and learn new vocabulary and expressions. Additionally, through telecollaboration, learners get to move beyond mere perceptions and representations of a country and culture to examining deeper issues that affect the inhabitants, such as social ills and underpinnings of morals and values, which form part of critical awareness telecollaboration. In the end, they may have a new vision and understanding of the culture which also helps them to clarify or suspend stereortypes that they might have had, as found by Batunan et al. (2023) and Madden and Ashby (2021). However, the perceptions formed are divergent and personalised based on the type and depth of interactions had with one's partner. Therefore, students' gains are heavily dependent on their partners' own experiences, points of view, and values system.

The same is true for the linguistic gains concerning the JC. Whilst all the Clermontois students learnt new words and phrases the Jamaican language remains non-standardised in orthography for many locals, as they speak and

 

write it on a continuum (Davidson & Schwartz, 1995). Still, it did not substract from the Clermontois students' experience, who expressed deep appreciation for the exposure. Importantly, however, the success of this phase of the telecollaborative project is attributed to students' willingness and open-mindedness to learn about a new language and culture. As indicated in the findings, telecollaboration provides an avenue for students to travel mentally to a foreign country based on the configuration of the pedagogical scenario, notably the topics discussed, the investment of the partners, and the communication devices chosen. The experience may cause students to grow personally and develop confidence in engaging strangers from other cultures to broaden their ICC.

## 6. Conclusions

The study shows that there is a space for LCTLs in telecollaborative scenarios, as telecollaboration has the potential to promote minority languages. French students welcomed the opportunity to learn about Jamaica and Jamaican Creole, which taught them historical and culture-specific information and improved their sociolinguistic knowledge. ClerKing allowed Clermontois students to improve their representations of Jamaica, moving from basic ideas, such as beaches, music and musical items, and athletes to gaining insights into social issues that affect the country and its people and understanding citizens' values and identities. Evidently, telecollaboration is a solution to help fulfil UNESCO's mandate to promote indigineous languages and cultures. As such, more collaboration and partnerships are needed between Jamaican and European and other universities to promote cross-cultural communication and exchanges.

Despite the gains from the project there were challenges encoutered due to logistical issues, such as the time difference between France and Jamaica (6-7 hours), institutional calendars (students' workload, assignments, and exams), and internet connectivity. The interactions between pairs occurred outside of structured class schedules; therefore, accomodation for communication was based on compromise and availabity of either party. Nonetheless, it would be interesting to establish telecollaborative projects where both sets of students have the opportunity to exchange within the parameters of class to lessen external factors that might affect the outcome in a negative way.

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# Learners are masters: The karaoke as an ergonomic dispositif for foreign languages learning

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***Abstract***

*The IT landscape is expanding and teaching strategies need to adapt, which tends to lead to recognition of an ergonomic perspective for education. The interest of our study is based on the ergonomics of technology for foreign language learning. We undertook fieldwork and data collection with first-year students in Canada to explore the potential of karaoke. We drew on Dörnyei's (2014) retrodictive methodology, analysing non-probabilistic data collected from elective participants learning English as a foreign language. The results show that learners tend to develop a sense of self-efficacy. Furthermore, it appears that the ergonomic design of the device allows for adaptation to the learner, ultimately facilitating its adoption for personal use. This preliminary research is currently being developed further to explore the matter in greater depth.*

***Keywords:*** *ergonomics; dispositif*; *foreign languages; popular culture.*

## 1. Introduction

Our research interests lie in popular songs used in the process of learning foreign languages. The point of such work is articulated through phonetics. We have undertaken fieldwork on a French-Canadian campus to gather data with first-year students learning English as a foreign language. Foreign languages are mainly learnt through textbooks following a method or an approach. In the frame of our previous data collections on the learning of foreign languages in Canada (G-Blili, 2017) we noted that phonetics is rarely taken into account, thus creating a need in aural comprehension and a weak oral production. The latest seems to be built around the learners' lack of self-confidence and poor self-efficacy in their learning process.

The aim of this paper is to present ergonomic theory and practice through the exploratory fieldwork we have studied. Our goal in this fieldwork was to gather data related to the potential of an instrument we are further developing currently—karaoke as a foreign language learning *dispositif*. In the French language, the term "*dispositif*" is defined in a dictionary (Larousse, n.d.) as "a set of measures taken, specific means used for a specific operation." When considering the karaoke device, it can be perceived as a tool that facilitates the acquisition of foreign languages, allowing learners to adapt it to their preferences and modify it according to their daily mood, for instance. In addition to the findings obtained from the study of Canadian learners, we present the introduction of a device currently under development for use in the field of educational ergonomics research. Thus, we present a conceptual overview including an ergonomic approach, as well as a socio-cognitive approach. Then, karaoke is shown as an educational *dispositif*. Finally, our empirical study will show the exploratory investigation undertaken according to educational ergonomics requirements.

 

## 2. The ergonomics of mediation

The field of ergonomics in education appears underrated in our viewpoint. Raby (2005) states that Vygotsky's (1988) and Rabardel's (1992, 1995) activity theory "encompasses material objects, artifacts, tools and instruments and seeks to explain how the appropriation of learning instruments brings into play collective schemes of usage …. A scheme is both a biological structure and an active organization of our experience which integrates the past and which evolves as it becomes adapted to new situations" (p. 3).

In his work, Rabardel (1995) refers to the instrument genesis and considers that the instrument is the result of human actions on the artefact. We accept the anthropocentric approach of Rabardel in which "human occupies a central position from which relations to technics, machines and systems are considered. This option puts man's activity at the core of the analysis and thus, allows to operate the needed inversion to refer to things depending on man" (p. 12).

The point is to allow learners' cognitive development in a material environment. To introduce everyday life's tools in a learning space, which switches on a "cognitive organisation" ranking learners' knowledge via a stimulus, these tools bring a particular context which is what instrumental mediation should be.

## 3. The karaoke *dispositif*

Karaoke can be employed as a pedagogical tool to facilitate the introduction of learners to phonetics and phonology with the objective of fostering phonological and sociocultural awareness, which is essential for the acquisition of a foreign language. Our conceptualisation of social-cultural ergonomics (see Figure 1 below) is based on the work of Vygotsky (1978), who proposed that learners create "tools of the mind" to navigate cognitive conflicts arising from linguistic and cultural interactions in a foreign language classroom. The psychologist emphasises that, in contrast to difficulties encountered when speaking in one's native language, those encountered when learning a foreign language are arbitrary and conscious. Learners make reference to their historical and social milieu, which they have mastered, including their alphabetisation and mother tongue. In light of the above, it can be seen that the social and cultural context in which learners operate on a daily basis provides a suitable frame of reference for the psycho-social considerations put forth by Vygotsky. In conclusion, it is imperative that learners are not stripped of their individual cultural identity.

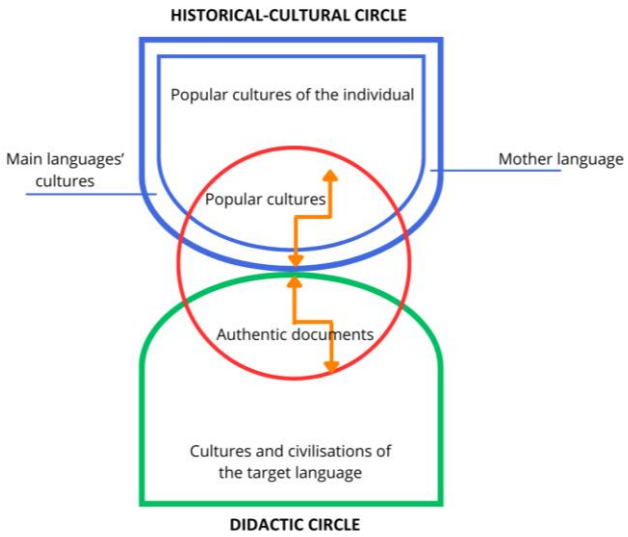


Figure 1. The hybridity of foreign language learning. Original diagram based on Vygotsky (1978).

"[T]he study of work environments is grounded in theories of mediated activities (e.g. Leontiev's activity theory, 1981; Piaget's genetic psychology, 1967; Vygotsky's theory of the instrument, 1986)" (Raby, 2005, p. 180). As illustrated in Figure 1, a correlation is evident between the historical and cultural circle and the didactic circle. The

historical and cultural circle encompasses the learner's familial cultural traditions, their native language and dominant language, and their alphabetisation. The didactic circle encompasses the cultures and civilisations of the target language. A third circle is drawn to illustrate the cultural and civilisational influences that learners may and should draw upon during the learning process. This circle encompasses popular cultures and authentic documents. In this final circle, arrows are added to symbolise the synchronisation of the historical-cultural and didactic circles, thereby illustrating the aforementioned schemes.

Some would probably suggest that students are reluctant to use the computer or the video because there is always a risk that they might break down; others will argue that it is more comfortable to stick to an instrument which you are accustomed to and will put forward a piagetian interpretation in terms of schemes (Piaget 1967). Another interpretation can be proposed which is inspired by the very nature of the instruments themselves, by their functioning constraints. (Raby et al., 2003, p. 15)

Indeed, the conceptualisation of educational ergonomics does not differentiate between social and cultural factors and those pertaining to education. Our karaoke system is predicated on this conceptual framework.

The diagram in Figure 2 below is constructed around the aforementioned ergonomic mediation. In the "synchronisation circle," two additional arrows are introduced: dynamic arrows that imply the micro and macro tasks inherent to the learning process. "In order to analyze a **work situation**, ergonomes or work analysts point out the relationships that unite behaviours and mental processes into a **task** model" (Raby et al., 2003, p. 4). The term 'micro task' is used to describe the cognitive tool that learners utilise when they encounter cognitive conflicts. The macro task may be defined as the reuse of knowledge. In the aforementioned circle, we designate this area as the 'inter space', wherein we situate the learner and the technologies. The circle below represents the immersion space for the karaoke (*dispositif*). It is noteworthy that the teachers have been excluded from this space, as they do not act as primary agents, but rather as facilitators. Consequently, they ensure the effective mediation and instrumentation of media.

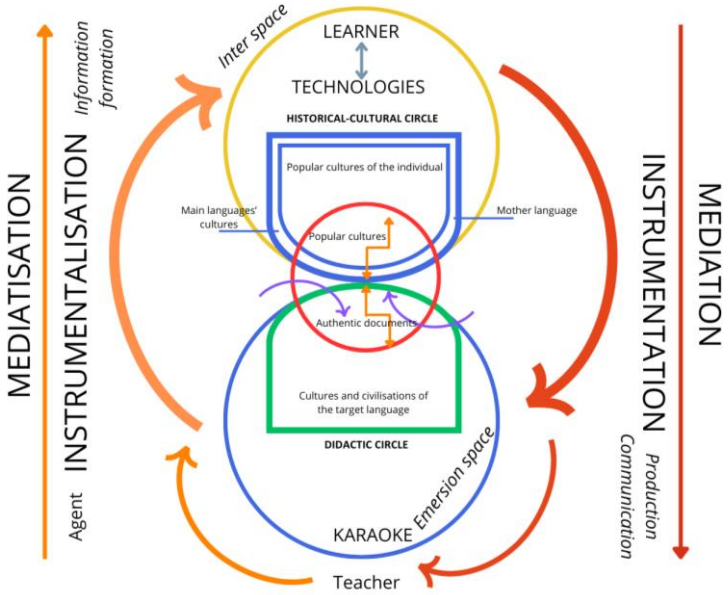


Figure 2. The Organics of Karaoke. Original diagram based on Bertin (2014).

Learners develop their own instrumental behaviours thanks to the *dispositif* showing its environmental dynamics. In our conception of educational and cognitive ergonomics, learning a foreign language would be inadequate if learners were not able to feel personal efficacy.

 

## 4. The *dispositif* enables multiliteracies

We wish to explain the difference we make between 'oral' and 'aural'. The latter happens when learners are in a comprehension process and 'oral' is performed when learners express themselves in the target language. The language laboratory is a fair place to perform what has been learnt, to test the auditory sense which contributes to linguistic articulation.

Besides, teaching linguistic knowledge such as pronunciation in foreign languages calls on "three dimensions; the language, the culture and the identity" (Wachs, 2011, p. 184). Learning phonetics is learning what we call the 'articulatory mechanism' of a foreign language. By articulatory mechanism, we mean that to understand the connected speech, prosody and phonetics of a foreign language, the learner needs to acknowledge the cultural surroundings of the target language. This awareness is possible in the language laboratory in aural and oral performances. Teaching language knowledge also means that the teacher takes into consideration the cultural habits of the learners (Wachs, 2011). In fact, learning a foreign language implies a new pronunciation, which requires a physical display from the learners who could think of it as a violation of their identity.

Karaoke is an instrument set in western cultural practices which could link the learners' identity along with the learning of foreign language articulation. When learning a foreign language, the student is in mediation with varied types of didactic aids such as audio, didactic or authentic documents or pictures which can be didactic as well as authentic, either static or animated. The way we think of the karaoke instrument combines two kinds of aids giving it a multimodal function. When learners use karaoke (*dispositif*) their auditory and visual senses are called upon. We believe that the karaoke brings a multisensory dimension which "requests more than the visual and auditory modes but the haptic mode as well" (Bara, Gentaz & Colé, 2004, p. 396). The touch and kinaesthetic senses of the learners allow them to be actors by beating to the music and prancing around.

Mediatisation suggests a critical viewpoint which aims at enhancing learners' sociocultural knowledge. The point is to respect learners as individuals, shaping their personality around a family culture and a generational culture, hence the introduction of popular songs and technologies in the *dispositif*. Besides, the learner is a social being taking part in a community of learners, which is a cultural community as well as an intercultural community, defining part of their learning in the target language.

## 5. Method

### 5.1. Context and participants

At the time of the field collection, there was a paucity of studies on karaoke in the classroom, and even fewer papers that shared fieldwork data. Our karaoke instrument has recently been introduced as a novel educational and language learning tool. In light of these considerations, we elected to undertake an exploratory study with the objective of analysing the ergonomic dimensions of karaoke.

 

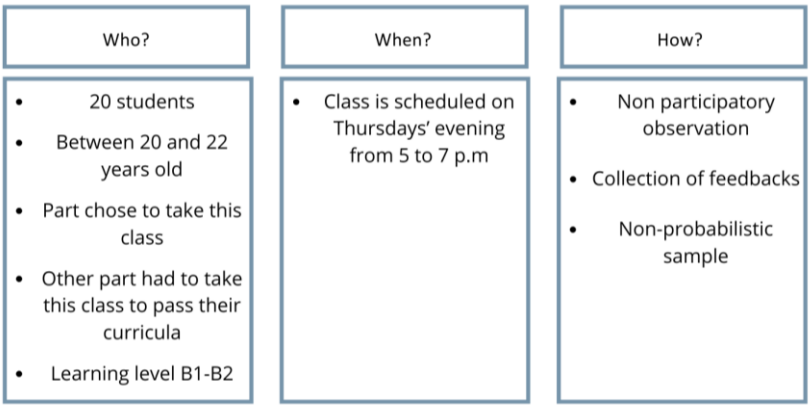


Figure 3. Presentation of the research participants.

*5.1.1. Collection field*

According to Raby et al. (2003), when working on educational ergonomics a relevant field to collect data is the one the learner usually works in. Our observation data collection focuses on the learners completing a learning task in the environment they are used to.

In the previous section of this paper, we mention that karaoke could be efficiently set up in the language laboratory. Nevertheless, to collect accurate data about karaoke potential, our fieldwork took place in the classroom with the students gathered as a class group. The place where students are the most used to learning a foreign language is the classroom. This is where we could complete our data gathering respecting ergonomics requirements and "see what is going on there, for the finest details of a subject's activity are influenced by sociological, cultural, organisational factors which will disappear in the traditional laboratory condition" (Raby et al., 2003, p. 4).

Because some teachers do not just base their teaching on textbooks and ICT, the point of research in ergonomics is to consider the learners' interactions with the whole environment. In the case of our study, we did not just observe the learners' interactions with karaoke and with the chosen songs but also with the tasks they were required to complete as well as the environment implied with karaoke—in other words, how the whole system suited the learners.

Karaoke is only relevant as a learning aid if the learners/users find a way to use it as such. It could be the way we envisage it and we could suggest it to them. Therefore, it would turn out as interesting if some of the learners showed or shared a personal strategy to use karaoke as a learning device. To collect the following data we referred to the learners' behaviours:

- How do they use their worksheet?
- When do they look at the screen?
- Are they sympathising with the songs (e.g. the choice, the rhythm)?
- Do they voluntarily take part in the class, or do they wait for the teacher to invite them?
- Do they ask questions to further the point?
- What are their reactions when it is time to sing along?
- Do they play along and is it shyly or enthusiastically?

Learners are users of karaoke and as they use it these instrumental behaviours are rising and they manage a way to make it their own, and this eventually becomes an easy way to work since as the learners' aim is met, karaoke's purpose is met as well.

The investigation of instruments such as karaoke and *dispositif* necessitates the utilisation of a dynamic research methodology. Dornyei's (2014) "'retrodictive qualitative modeling'—that reverses the usual research direction by starting at the end—the system outcomes—and then tracing back to see why certain components of the system

 

ended up with one outcome option and not another" (p. 80) appears to be an appropriate methodology, as it has enabled us to predict the data that we will focus on.

## 6. Results

The subsequent analysis of the data collected is contingent upon the methodology employed in the field. The objective of our research was to explore the practices of the target language with our didactic instrument, the karaoke didactic tool, in order to detect a sense of personal efficacy. To this end, we have provided a detailed analysis of our three field observations with the didactic instrument. Creswell (2014) reminds us that qualitative research is interpretative in nature. Qualitative research is characterised by a process of interpretation and phenomenological description, without which it would not be possible to disseminate the observations and data collected during the exploratory phase of this research. The objective is to "emphasise the description of natural phenomena" (Crête, 2009, p. 292). As previously stated, the observations and questions are centred on the concepts pertinent to our overarching research objective, namely, to examine the didactic potential of karaoke in foreign language learning. The analysis of the data is grounded in a specific aspect of mediation with the instrument, as defined above (Fortin, 2010; Yin, 2009). In order to achieve this, the data was subjected to a process of coding.

### 6.1. Karaoke No. 1 and No. 2

Following the introduction of the concept of karaoke to the students, a positive response was observed, as evidenced by their smiling demeanour. The smiles displayed by some of the students indicated shyness, whereas others appeared to convey feelings of inhibition or hesitation. Nevertheless, some students displayed motivation and comfort with the forthcoming activity.

The objective of these classes was to integrate the teaching of syntax and prosody with the use of karaoke. It was therefore proposed that the students should be permitted to indicate the words in the song that were accented. The diagrams of the karaoke scenarios below highlight the key moments of our observation data collection.

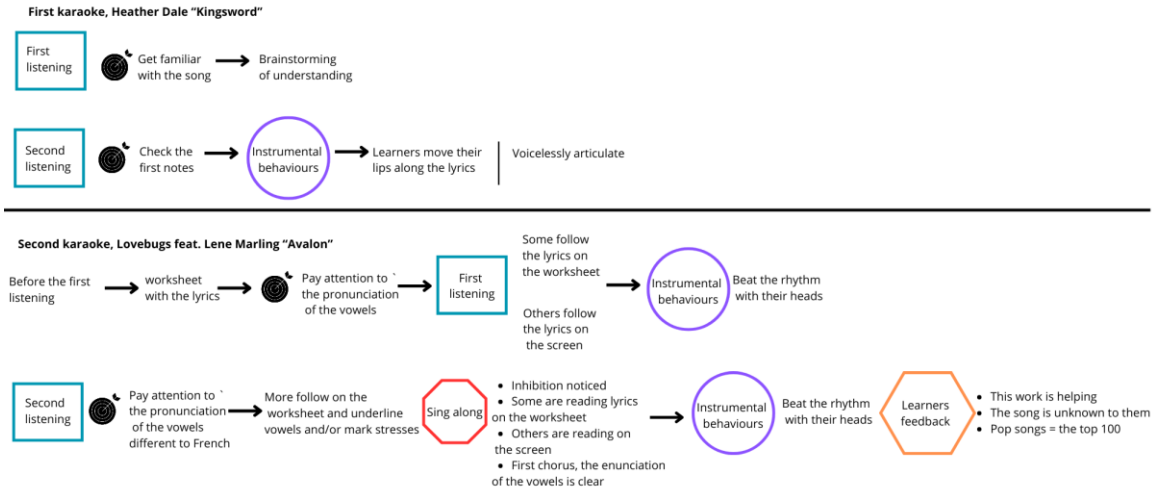


Figure 4. Karaoke No. 1 and No. 2 scenarios.

As they check their work with their teacher, it seems that all of them have underlined vowels and realised that some vowels in English become complex vowels, i.e. diphthongs. One of the students seems confused when vowels sound much like they would in French. For instance, she did not realise that the word 'come' was not pronounced with a [o] sound but with a [ʌ] sound. One student makes a comment that 'I' is a vowel bearing a diphthong. To give an example, this learner's neighbour carries on reading a whole sentence with vowels as they would be read in French. The students laugh and she comments that it does not make sense anymore if we do not respect this phonetic rule. Another student reads the words without the diphthongs and the class laughs again. A

student points the difference between the English pronunciation of ‘love’ and the French one saying in English [lʌv] and then in French pronunciation [lov], even exaggerating the [o] sound.

Now it seems that most of them have understood the difference between French and English vowels. Only a few of them seem to understand the accentuation difference between French and English. They are asked by their teacher to listen to the song again and to carefully listen to accentuations.

### 6.2. Karaoke No. 3

We ask the teacher to present the last observation day with a clip from a popular series called *The Big Bang Theory*. When the teacher announces to her students how the class will start, she gets all their attention. Then, she announces that the last song will be sung by Pink. Most students nod in unison and look at each other smiling with happiness. As the worksheet is given to the students we can already hear one of them singing *a cappella*.

Before the teacher plays *The Big Bang Theory*’s clip she explains the point of showing it to them and asks them to listen to Sheldon’s speech and to focus on his speech rhythm and the emphasis he puts on his words. They will compare the English prosody to the French one.

As they watch the clip they smile showing they understand what is being said. After the clip the teacher asks them what they think of it. A student answers that he thinks that English is less monotonous than French. The teacher explains that French is quite staccato, that every syllable is pronounced, and she gives the examples of the word ‘*environnement*’ and cuts it in syllables ‘en/vi/ron/ne/ment’, and then says it in English ‘environment’.


Figure 5. Karaoke No. 3 scenario, first part.

As the first listening is over, the teacher asks them about the pronunciation. The pronunciation of some words has surprised the students. One of them gives the word ‘tear’ as an example. Then the teacher takes some time to help the students localise the accents on a few words. As the teacher says the words, we notice some students moving their hands along with the syllables.

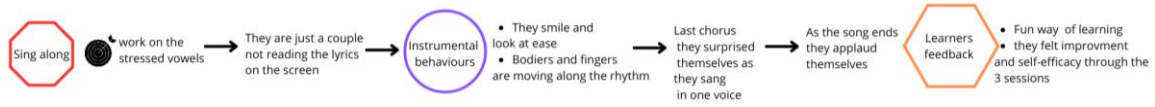


Figure 6. Karaoke 3 scenario, last part.

Fewer students answered that they felt stressed when they had to express themselves in class when expressing real situations. Raby et al. (2003) assert that “[f]inally, the aim of ergonomics is not to produce general laws, it is more to improve specific work situations” (p. 4). After the last karaoke practice, students seemed to have assimilated the purpose of oral and aural practice and that karaoke could be of help. In fact, one student shared that she felt better from the beginning to the end. A few students who were reluctant in the beginning showed more interest by the end of our observation.

The observation data collection shows all kinds of challenges faced by the learners about the pragmatic environment—the use of karaoke or the innovative kind of working situation suggested. On the contrary, at the beginning of our collection it seemed that a few of them were reluctant to take part in the task because of epistemic difficulties with their abilities in the target language.

 

## 7. Discussion

The *dispositif* (Berten, 1999) includes systems and organisations which help the users-learners to regulate their working situation and to find some ways to accept the learning environment. The dynamic environment of karaoke appears to foster the development of instrumental behaviours. While the lyrics are displayed on the screen, students take notes on their worksheet, matching the rhythm, moving their lips along the song, humming or singing along. This demonstrates the ergonomic principles of karaoke. This demonstrates that learners are capable of organising and regulating their work, and that each individual can adapt the karaoke device to suit their needs.

It can therefore be concluded that the device is ergonomic, as demonstrated in the initial phase of this fieldwork. The learners indicated an increase in their sense of self-efficacy (Bandura, 2007) with regard to their oral and aural skills as a result of the training. It is noteworthy that learners demonstrate a discerning approach to the selection of songs employed to enhance their proficiency in the target language. This provides them with a source of motivation. These findings corroborate our initial hypothesis that learners perceive a necessity to engage in oral/aural practice. On occasion, they exhibit a willingness to eschew traditional textbooks and grammatical conventions in favour of authentic language usage.

The study could not be furthered through interviews with the participants, and thus further investigation is required. This results in a restriction in the scope for interpreting our observations. Nevertheless, this fieldwork introduces a number of new elements with regard to the use of authentic documents, the acquisition of foreign language skills and the utilisation of technological tools.

## 8. Conclusions

This paper brings karaoke to the academic and scientific field. Through our research we explore alternative forms of learning to complete the standard foreign language class. The results we share in this paper admit that karaoke has been well accepted by the actors of a classroom, both learners and teacher. This paper conveys an original contribution to the scientific research in education. It explores the importance in resorting to popular culture for the oral practice of foreign languages. This paper also insists on the possible comfort and self-efficacy learners could find.

The karaoke *dispositif* could be an additional tool to take into a language laboratory for individual work or in the classroom for group work. It is efficient for the introduction of oral/aural practice and phonetic work involved in foreign language learning. Among our future projects we would set karaoke in the language laboratory. This fieldwork is of great interest because it could help to check a learner training potential. The karaoke *dispositif* opens a path of research for learning and teaching foreign languages. It appears important to consider the assets of popular cultures that the individual sees as part of their personality.

## Acknowledgements

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# Mobile resources to improve oral proficiency beyond the classroom: Focus on Tourism students in Central America

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***Abstract***

*Adopting a social interactionist approach to technology for speaking development (Egbert & Shahrokni, 2018), this paper evaluates the potential of mobile-based resources to promote semi-autonomous speaking practice for second language (L2) tourism students at a university in Central America. Tools were evaluated based on Chapelle and Jamieson's (2008) and Stockwell and Hubbard's (2013) criteria for evaluating technologies for L2 learning. Based on the literature reviewed and analysed and the feedback received from potential participants, we conclude that the oral presentation tasks using the virtual reality tool Google Arts and Culture Virtual Field Trips (formerly Google Expeditions), together with the pedagogical use of speech technologies, have the potential to improve speaking in mobile contexts outside the classroom. Based on these findings, this paper outlines a proposed study in which students from the target population use Google Arts and Culture Virtual Field Trips together with oral feedback from peers, text-to-speech synthesis and automatic speech recognition applications. Insights from our findings may interest L2 educators seeking to improve their students' communicative abilities.*

***Keywords:*** *Mobile-assisted Language Learning (MALL); speech technologies; Google Arts and Culture; English for tourism purposes; virtual reality.*

## 1. Introduction

Mobile technology holds enormous potential for teaching and learning across diverse educational contexts (UNESCO, 2014). In particular, positive outcomes in second language (L2) acquisition can be achieved through mobile-assisted language learning, as evidenced by recent research (e.g., Stockwell, 2022). However, L2 learners in some of these environments have limited access to advanced mobile devices and applications. Therefore, resources for these students should account for this constraint (e.g., materials must be compatible with basic mobile tools and easily accessible with limited high-speed connectivity). For the target population of undergraduate Tourism students in Central America who have low English oral proficiency (Gordon, 2021) and who need to develop communicative skills for the workplace, it is therefore important to determine which mobile-based resources have the potential to enhance their oral skills.

Interviews with stakeholders at the university indicate that (1) students lack the speaking skills to engage with tourists in English, and (2) teachers have difficulty teaching the wide range of proficiency levels within classes. As outlined by Cardoso (2022), mobile technology proposes solutions to these challenges, as it provides

 

opportunities for increased autonomous practice for students of all proficiency levels, which can lead to the development of oral skills via human-machine interactions. A further consideration is that mobile phones are available to all students in the target population. For these reasons, mobile technology has been selected for this project, and a social interactionist framework to language learning will be adopted (Egbert & Shahrokni, 2018), emphasizing technology-enhanced social interactions.

Given the context and the issues described above, the goals of this paper are (1) to explore research on mobile-based resources for speaking development; (2) use these findings to select mobile tools to promote autonomous speaking practice; and (3) outline a proposed study in which students from the target population (Tourism students in Central America) use the selected tools to improve their oral performance. This paper therefore evaluates the extent to which mobile technologies, when used for autonomous L2 learning beyond the classroom, might improve oral skills in the target population.

## 2. Analyzing the literature and selecting target technologies

Potential tools identified in the literature review (see Section 3) were evaluated based on Chapelle and Jamieson's (2008) and Stockwell and Hubbard's (2013) criteria for evaluating technologies for L2 learning. Chapelle and Jamieson (2008) identify five main criteria which should be met to determine if CALL technology has the potential to encourage speaking development. These are summarized in Table 1 below:

**Table 1.** CALL criteria for speaking development. Adapted from Chapelle and Jamieson (2008).

| Criterion | Oral Communication Skills |
|---|---|
| 1. Learner fit | Listening materials for input with an appropriate range of language varieties and oral features that learners need to be familiar with.<br>Opportunities that create the need to exchange information and collaborate with more competent peers or native speakers orally. |
| 2. Explicit teaching | Resources provide explicit teaching of speaking (including pronunciation) and multiple opportunities for individualized practice. |
| 3. Interaction with computer and other learners | Opportunities to practise listening to a model, then speaking; remembering groups of words as single units to develop automaticity, fluency, and formulaic sequences.<br>Opportunities for learners to record their speech. |
| 4. Evaluation and visual feedback | Activities provide accurate feedback to learners about their progress, preferably in the form of visual feedback that learners can easily understand. |
| 5. Strategy development | Resources guide learners towards the development of learning strategies which allow them to continue improving their oral skills beyond the classroom (e.g., by using online reference tools). |

In addition, when selecting MALL resources, it is important to consider ten criteria for technologies such as tablets and smartphones (Stockwell & Hubbard, 2013). These are outlined below in Table 2.

**Table 2**. Criteria for evaluating the pedagogical potential of mobile technologies. Adapted from Stockwell and Hubbard (2013).

 

| Evaluation Criteria |
|---|
| 1. The affordances and limitations of both the mobile device and the environment are considered in light of the learning goals. |
| 2. Multi-tasking and environmental distractions are limited. |
| 3. Learners have control over the frequency of push events. |
| 4. Consideration is given to equal access. |
| 5. Language learner differences are accommodated. |
| 6. How learners' use their devices is taken into consideration. |
| 7. Mobile language learning activities are short. |
| 8. Language learning tasks are suited to both the technology and the environment, and the technology and environment are suited to the task. |
| 9. Learners are given guidance to effectively use their mobile devices for language learning. |
| 10. The views of multiple stakeholders involved in mobile learning are considered. |

A selection was made based on the extent to which resources fit these 15 criteria for speaking development via mobile-assisted language learning.

## 3. Results: Systematic selection of MALL tools and activities

Stockwell and Hubbard's (2013) ten criteria for effective MALL implementation were applied at all three stages of the selection process: to initially select the type of mobile device and general learning activities (Stage 1), to select specific mobile applications and tasks for use on the selected devices (Stage 2), and for future planning, i.e., to guide implementation of the proposed research project (Stage 3).

### 3.1. Stage 1: Initial selection based on research context, resources, and needs

Table 3 outlines five of Stockwell and Hubbard's (2013) criteria applied in Stage 1. While the first column illustrates the criteria, the second highlights the target criterion as it applies to the research context. Note that the other five criteria are outlined in Stages 2 and 3.

**Table 3**. Selection of device and focus of learning activities.

| Stockwell and Hubbard's (2013) MALL Criteria | Application to Research Context |
|---|---|
| 1. Affordances and limitations of mobile device and environment are considered in light of learning goals (criterion #1). | Android smartphones are available to all tourism students. Wi-Fi connectivity is available at university and in homes. Most students do not have data plans, therefore learning activities should be designed for use on campus and in homes where Wi-Fi is accessible. |

 

| Stockwell and Hubbard's (2013) MALL Criteria | Application to Research Context |
|---|---|
| Learning goals (criterion #1). | Speaking development for undergraduate tourism students. This requires the design of pedagogical activities which target the development of oral proficiency. |
| 2. Multi-tasking and environmental distractions are limited (criterion #2). | Learning activities can only be completed on the university campus and in homes, potential environmental distractions which may exist in public spaces or when using public transport therefore do not apply to this context. Multi-tasking will be limited by designing short activities with clear goals and stages to encourage learners to stay focused. |
| 3. Consideration given to equal access (criterion #4). | Android smartphones are the selected device due to availability in the target community. Learning activities should be designed for use on campus and in homes where Wi-Fi connectivity is available. |
| 4. Mobile language learning activities are short (criterion #7). | The pedagogical design will prioritize short activities with clear goals and stages to encourage learners to stay focused. |
| 5. The views of multiple stakeholders are considered (criterion #10). | Interviews and surveys were conducted with tourism educators, students, and employers to determine perceptions of possible causes of and solutions to students' low oral proficiency. |

The tools selected to improve oral performance must therefore be available for Android smartphones, and should include a variety of short, focused learning activities. The literature review shows that the MALL resources with the greatest potential to fulfill these criteria include the four technology types for speaking development suggested by Cardoso (2022): text-to-speech synthesis (TTS), automatic speech recognition (ASR), computer-mediated communication tools (e.g., video recording apps), digital games, and virtual reality (VR). Table 4 shows a list of these freely available MALL resources with the potential to improve speaking performance for tourism students working semi-autonomously beyond the classroom.

**Table 4.** MALL self-study resources with the potential to improve oral performance.

| Technology Type | Resource | Study |
|---|---|---|
| Speech Technologies | TTS | Cardoso (2018); Liakin et al. (2017); McCrocklin (2016) |
| | ASR | De Vries et al. (2015); Golonka et al., (2014); Liakin et al. (2017) |
| | Chatbots | Belda-Medina and Calvo-Ferrer (2022); Godwin-Jones (2023) |
| | Intelligent personal assistants | Dizon (2020); Moussalli and Cardoso (2020) |

 

| Technology Type | Resource | Study |
|---|---|---|
| Computer-Mediated Communication | Video recording apps | Dyson (2014); Gromik (2012) |
| Digital Games | SpaceTeam ESL | Grimshaw and Cardoso (2018) |
| Virtual Reality | Google Expeditions | Ebadi and Ebadijalal (2020); Xie et al. (2021) |

Table 5 shows pedagogical techniques which can be incorporated into activities adopting these MALL technologies.

**Table 5.** Pedagogical techniques to use with MALL resources to improve oral performance.

| Pedagogical Technique | Study |
|---|---|
| Oral peer feedback | Ebadijalal and Yousofi (2023); Lin et al. (2021) |
| Shadowing | Foote and McDonough (2017); Teeter (2017); Viberg and Kukulska-Hulme, (2022) |

### 3.2. Stage 2: Selection of specific MALL resources

Of the four technology types for speaking development for use on smartphones, tourism-based VR simulations appear to provide the greatest opportunities for acquiring the profession-specific vocabulary and oral skills required to improve L2 speaking proficiency in English for tourism purposes (Ebadi & Ebadijalal, 2020; Lin et al., 2021; Xie et al., 2021). This is because tourism-based VR applications provide opportunities to learn about tourist sites around the world (Ebadi & Ebadijalal, 2020; Lin et al., 2021; Xie et al., 2021): these are opportunities for learning in context (Kaplan-Rakowski & Gruber, 2021), or situated learning (Lave & Wenger, 1995). Additionally, VR interactions take place *around*, *through*, and *with* the computer, providing an immersive, anxiety-reducing environment which motivates interaction and risk-taking and promotes spontaneous speech and planning—skills that are required when speaking (Cardoso, 2022).

Although the use of Google Expeditions enables learners to make significant improvements in oral proficiency (Ebadi & Ebadijalal, 2020; Xie et al., 2021), there are few studies which investigate, over an extended period of time, the use of VR tools to improve speaking skills, or the use of VR tools in combination with immediate feedback from human or technological tutors (Xie et al., 2021). It would therefore be useful to fill this gap by investigating the use of VR in combination with immediate feedback from both humans and technology (e.g., TTS and ASR) to improve speaking skills. This will be the focus of a future study. In 2021, the Google Expeditions VR tours moved to the Google Arts and Culture application, where they are called Google Arts and Culture Virtual Field Trips (Google Arts and Culture, n.d.). The proposed study will therefore use the VR tours by Google Arts and Culture Virtual Field Trips. In terms of pedagogical techniques, it would be useful to include individualized tasks such as shadowing, and collaborative tasks requiring oral peer feedback, as shown in Table 5.

In order to assess the extent to which the VR tool Google Arts and Culture Virtual Field Trips, together with feedback from humans and from the speech technologies TTS and ASR can promote L2 oral proficiency, both Chapelle and Jamieson's (2008) CALL criteria for speaking development and Stockwell and Hubbard's (2013) MALL criteria for evaluating technologies for L2 learning were applied. As illustrated in Table 6, these three tools fulfil the following criteria for technology-enhanced language instruction.

 

**Table 6.** Stage 2: Selection of resources for language instruction.

| Tool | CALL Criteria for Speaking Development | MALL Criteria for Evaluating Technologies |
|---|---|---|
| Google Arts & Culture Virtual Field Trips (with oral peer feedback in dyads) | Learner fit: opportunities that create the need to exchange information and collaborate (criterion #1). | Language learning tasks are suited to both the technology and the environment, and the technology and environment are suited to the task (criterion #8). |
| | Strategy development: resources guide learners towards the development of learning strategies which allow them to continue improving their oral skills beyond the classroom, e.g., by using online reference tools (criterion #5). | Language learner differences are accommodated (criterion #5). |
| TTS (individualized learning) | Learner fit: listening materials for input with an appropriate range of language varieties and oral features that learners need to be familiar with (criterion #1). | Language learning tasks are suited to both the technology and the environment, and the technology and environment are suited to the task (criterion #8). |
| | Explicit teaching: resources provide opportunities for noticing pronunciation features and for repeated individualized practice (criterion #2). | Language learner differences are accommodated (criterion #5). |
| | Interaction with computer and other learners - Opportunities exist to practise listening to a model, then speaking; remembering groups of words as single units to develop automaticity, fluency, and formulaic sequences (criterion #3) | |
| ASR (individualized learning) | Explicit teaching: resources provide opportunities for noticing pronunciation features and for repeated individualized practice (criterion #2). | Language learner differences are accommodated (criterion #5). |
| | Interaction with computer and other learners: opportunities for learners to see spoken output transcribed on the screen (criterion #3). | |
| | Evaluation and visual feedback: activities provide accurate feedback to learners about their progress, preferably in the form of visual feedback that learners can easily understand (criterion #4). | |

 

Based on this analysis, the proposed resources will incorporate listening materials for speaking input which tourism students will select, based on the content of the Google Arts and Culture Virtual Field Trips, and subsequently upload to a TTS tool. This will fulfil the criteria for authentic language that the target population of tourism students will need when interacting with interlocutors in the tourism workplace. Additionally, targeted pronunciation practice will be proposed via TTS. For learners to develop automaticity, fluency, and formulaic sequences, shadowing, i.e., repetition of phrases and sentences, will be implemented using TTS. With freely available TTS software such as *Natural Reader*, learners can control the speed of speech, visualize words as they are being read with the highlighting feature, and select male or female voices from a variety of accents. Once students have become aware of certain pronunciation patterns, they can transfer the knowledge gained in perception to production by using ASR tools to improve oral production (Cardoso, 2018). This latter activity provides learners with opportunities for feedback - e.g., to verify if their speaking abilities are intelligible to the speech recognizer.

In addition, activities that involve pairs or small groups of students to work together through the computer to solve a problem are important for speaking development (Chapelle & Jamieson, 2008). The target population of tourism students could achieve this by completing worksheet tasks in dyads based on the content viewed using the VR application, as in Lin et al. (2021). Finally, to cater to learners' individual differences and preferences, more than one resource will be proposed in the form of individual, dyadic, and group tasks. This is because if learners are not ready to work independently, collaborating with others can help them to stay engaged in tasks (Stockwell, 2022).

### 3.3. Stage 3: Future analyses

Table 7 below outlines additional criteria from Stockwell and Hubbard (2013) for selecting appropriate MALL tools for L2 learning. This stage is ongoing and will be addressed in a future study (see also Section 4).

**Table 7.** Stage 3: Future analyses.

| Stockwell and Hubbard's (2013) MALL Criteria | Application to Research Context |
|---|---|
| 1. Learners have control over the frequency of push events (criterion #3). | To be determined. |
| 2. How learners' use their devices is taken into consideration (criterion #6). | Survey on learner perceptions of mobile learning and mobile use conducted. Data to be analyzed. |
| 3. Learners are given guidance to effectively use their mobile devices for language learning (criterion #9). | Discussed in section 4 (Proposal and Conclusions). |
| 4. The views of multiple stakeholders involved in mobile learning are considered (criterion #10). | Surveys conducted with tourism educators and students on perceptions of mobile learning. Data to be analyzed. |

The literature review and analysis therefore suggest that oral presentation tasks using the Google Arts and Culture Virtual Field Trips may be used effectively in a mobile-based environment to improve spoken proficiency in mobile contexts outside the classroom. Specifically, this tool is likely to be pedagogically effective when paired with oral peer feedback and feedback from the speech technologies TTS and ASR.

 

## 4. Discussion and proposal for a future study

The goals of this paper were (1) to explore research on mobile-based resources for speaking development; (2) to use these findings to select mobile tools to promote autonomous speaking practice; and (3) to outline a proposed study in which students from the target population use the selected tools to improve their oral performance. Our findings suggest that the target population of tourism students with low oral proficiency would benefit from a VR-based MALL program beyond the classroom to promote speaking development. This program will include individualized learning tasks with feedback from TTS and ASR and tasks in dyads with oral peer feedback. Additionally, as learners are reluctant to explore MALL opportunities unless they are linked to a grade in class (Botero et al., 2019; Gao & Shen, 2021), it would be important to include a classroom assessment task to evaluate the work completed outside the classroom with the selected MALL resources (Ebadi & Ebadijalal, 2020; Xie et al., 2021). This will involve ongoing collaboration with the tourism educators to determine the type of graded task to be included in their curriculum.

Tourism students will therefore use Google Arts and Culture Virtual Field Trips to prepare for oral presentation tasks based on the virtual locations visited. The involvement of both peers and technology as complements to the selected VR tool, Google Arts and Culture Virtual Field Trips, responds to Xie et al.'s (2021) proposal that mobile-based VR tasks should include practice tasks that provide immediate feedback from both humans and technology. This research project will therefore be implemented in a way that students from the target population use this approach to improve their oral proficiency semi-autonomously, beyond the classroom. The experimental mobile-based learning study, which is expected to run for 12 weeks, will measure the effect of these mobile-based tasks on oral performance. The effectiveness of ASR and TTS in promoting speaking development will be investigated by randomly assigning students to three conditions of autonomous preparation tasks: ASR, TTS, and ASR combined with TTS. Additionally, to fulfill Stockwell and Hubbard (2013)'s criteria for effective MALL implementation, emphasizing the importance of learner training, a comprehensive orientation and training program will be conducted at the start of the experimental study.

## 5. Conclusion

Our analysis of the literature and an evaluation of existing technologies for speaking development showed that specific MALL resources and activities are suited to both the available resources and learning needs of the target population. These undergraduate tourism students in Central America will most benefit from individual and collaborative tasks based on the VR resource Google Arts and Culture Virtual Field Trips, in conjunction with the speech technologies TTS and ASR. Such research will also respond to Viberg and Kukulska-Hulme's (2022) call for further insights into ways of encouraging learners to develop skills for both self-regulated and collaborative learning with MALL beyond the classroom.

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# The importance of Computer-Assisted Language Learning (CALL) in revitalising and preserving Maltese

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***Abstract***

*Maltese, a unique Semitic language influenced by Arabic, Italian and English, faces challenges as a minority language in the digital age. This study examines the potential of Computer-Assisted Language Learning (CALL) in addressing these issues. One-on-one interviews with 34 Maltese teachers revealed challenges like limited digital resources, insufficient integration into educational technologies, and a lack of CALL tools tailored to Maltese. These challenges are worsened by the small number of native speakers and the influence of English, which is also an official language in Malta. However, the study highlights the importance of CALL in revitalising and preserving Maltese. CALL can provide interactive language learning apps, online courses, and digital archives, making learning Maltese more accessible and engaging. It can also foster a sense of community among learners and native speakers, promoting cultural preservation and language transmission. This study contributes to the discourse on endangered languages and CALL, emphasising the need to support linguistic diversity and connect Maltese learners and communities. It underscores the hope of ensuring the survival and flourishing of this unique language in the technological era.*

***Keywords:*** *Computer-Assisted Language Learning (CALL); digital language preservation; minority languages in the digital age; Maltese language.*

## 1. Introduction

In the digital age, minority languages face significant challenges and opportunities. Maltese, a unique Semitic language with Arabic, Italian, and English influences, exemplifies this struggle (Żammit, 2023). As the digital landscape progresses, preserving and revitalising Maltese has become increasingly urgent (Żammit, 2020). This study explores how Computer-Assisted Language Learning (CALL) can address the specific challenges Maltese faces as a minority language in the digital era.

Brincat (2011) highlights the historical and sociolinguistic development of Maltese, noting its distinct position as a Semitic language written in Latin script. Borg et al. (2014) emphasise its morphological and syntactic complexity, underscoring the difficulties in creating effective CALL tools for Maltese. Żammit (2024) focuses on how digital tools can enhance Maltese language acquisition and cultural preservation. Technology's potential to support minority languages, as discussed by Thorne et al. (2012) and Olko and Sallabank (2021), suggests that CALL can play a key role in promoting linguistic diversity.

Despite the progress, Maltese still suffers from limited digital resources, a lack of integration into educational technologies, and the dominance of English, which is also an official language in Malta. These challenges hinder the Maltese language's transmission and preservation, necessitating targeted interventions through CALL.

### 1.1 Statement of the Problem

Despite its rich linguistic heritage, Maltese faces significant challenges in the digital age. The limited availability of CALL tools, insufficient integration into educational technologies, and the influence of English further marginalise Maltese speakers. This study examines how CALL can support the preservation of Maltese in a rapidly evolving digital environment.

### 1.2 Aims of the Study

This study aims to:

- identify the specific challenges Maltese faces as a minority language in the digital age.
- examine the potential of CALL in overcoming these challenges.

### 1.3 Research Questions

The research questions of this study were the following:

1. What are the primary challenges Maltese faces as a minority language in the digital age?
2. How can CALL be utilised to address these challenges and support the revitalization and preservation of Maltese?

By addressing these questions, the study provides insights into how digital tools can support linguistic diversity and ensure the survival of Maltese in the technological era.

## 2. Method

### 2.1 Context and participants

This study employed purposive sampling to select participants who are secondary school teachers actively involved in teaching the Maltese language. The sample consisted of 34 teachers, ensuring a comprehensive understanding of the challenges faced in the educational context. The age range of the participants was between 25 and 61 years old, distributed as follows: 8 teachers in their 20s, 10 in their 30s, 9 in their 40s, 6 in their 50s, and 1 teacher who was 61 years old. The gender distribution included 20 female and 14 male teachers.

### 2.2 Data collection

Data collection was conducted through one-on-one semi-structured interviews, each lasting approximately 30 minutes. This approach allowed for an in-depth exploration of the teachers' experiences and perceptions concerning the challenges of teaching Maltese in the digital age. In total, 34 interviews were conducted, amounting to approximately 17 hours of cumulative interview time.

The semi-structured format balanced a flexible, conversational approach with specific guiding questions. The interview questions focused on the following key areas:

- Challenges in teaching Maltese: "What are the primary challenges you face when teaching Maltese, particularly regarding digital tools or resources?"
- Use of technology: "How do you currently use technology, if at all, in your Maltese language teaching? What tools or platforms do you find helpful or lacking?"

 

- Perceptions of CALL: "What is your understanding of Computer-Assisted Language Learning (CALL), and how do you think it could support Maltese language teaching?"
- Digital resource needs: "What specific digital resources do you think would help improve the teaching and learning of Maltese?"
- Community and cultural aspects: "In your opinion, how important is fostering a sense of community or cultural preservation in your teaching? Can technology support these efforts?"

This structure ensured consistency across interviews while providing flexibility for participants to elaborate on their individual experiences and offer unique insights.

### 2.3 Data analysis

The data were analysed using a thematic approach, facilitated by Nvivo software. This method involved coding the interview transcripts to identify recurring themes and patterns. The thematic analysis allowed for the systematic categorization of data, providing a clear framework to understand the challenges and potential solutions for integrating CALL in the teaching of Maltese. Nvivo enabled efficient management and analysis of the qualitative data, ensuring that the findings were both rigorous and comprehensive (Goyal & Deshwal, 2023).

### 2.4 Ethics

Ethical considerations were paramount throughout the study. Permission for conducting the interviews was obtained from the Faculty Research Ethics Committee (FREC), ensuring that the study adhered to ethical standards and guidelines. The participants were informed about the purpose of the study, and their consent was obtained before the interviews. Confidentiality and anonymity were maintained throughout the research process, with all data securely stored and accessible only to the research team.

## 3. Results

The interviews with 34 Maltese language teachers revealed several key challenges in the context of Computer-Assisted Language Learning (CALL) and the broader digital landscape. The findings highlight issues related to limited digital resources, insufficient integration of educational technologies, and specific concerns regarding the tools available for teaching Maltese. The following quotations illustrate the teachers' perspectives and experiences, providing a nuanced understanding of these challenges.

### 3.1 Lack of interactive digital resources

All the 34 participants consistently pointed out the scarcity of interactive digital resources tailored for Maltese. Teacher 1 stated, "We need more interactive apps and games that can engage students. Right now, there are barely any resources that make learning Maltese fun and interactive." Similarly, Teacher 13 remarked, "Other languages have a wealth of digital tools, but for Maltese, we're lagging far behind. This makes it harder to motivate students." Teacher 34 agreed with Teacher 1 and Teacher 13, emphasising, "The lack of digital resources is a major barrier. We need tools that can capture the students' interest and make learning Maltese enjoyable and effective." In contrast, Teacher 22 expressed a slightly different perspective, suggesting, "While interactive resources are important, I find that traditional teaching methods supplemented with technology can also be effective. Sometimes, simplicity works better than complex digital tools."

However, Teacher 15 disagreed with this viewpoint, arguing, "Simplicity might work, but it won't engage today's students like interactive apps and games can. We need to keep up with the digital age if we want to keep Maltese relevant and interesting for the younger generation." Furthermore, Teacher 28 highlighted a practical concern, stating, "Even the few interactive resources we have often lack updates and maintenance. This inconsistency frustrates both teachers and students, undermining their effectiveness."

Therefore, while there was a consensus among the 34 teachers regarding the need for more interactive digital resources for teaching Maltese, there were varying opinions on the best approach to enhance engagement and effectiveness in Maltese language learning. Addressing these concerns is crucial to overcoming the challenges posed by the digital age and ensuring the vitality of Maltese as a minority language.

### 3.2 Absence of VR and AR games

Another significant challenge highlighted by 29 teachers was the absence of Virtual Reality (VR) and Augmented Reality (AR) games specifically designed for learning Maltese. Teacher 8 noted, "I've seen firsthand how effective VR and AR can be in language learning for other languages. It's a shame we don't have similar tools for Maltese." Teacher 21 echoed this sentiment, by stating, "The immersive experience of VR and AR could change how we teach Maltese. It's disappointing that these technologies are not being used." Teacher 12 agreed with Teachers 8 and 21's viewpoints, by emphasising, "VR and AR could make learning Maltese more engaging and memorable. Students would be more motivated to practise and improve their language skills in a virtual environment."

Nevertheless, Teacher 19 provided a counter perspective, saying, "While VR and AR are exciting, they are also expensive and require significant technical support. It may not be feasible for all schools to adopt these technologies." Teacher 27 echoed this concern, by adding, "The infrastructure for VR and AR in our schools is lacking. Before we can introduce these technologies for Maltese language learning, we need to address these logistical challenges." Furthermore, Teacher 33 suggested a middle ground, by stating, "While VR and AR would be beneficial, we should focus on enhancing existing digital resources first. Improving accessibility and functionality of current tools should be our priority."

While there was enthusiasm among teachers for integrating VR and AR into Maltese language education, practical considerations such as cost, infrastructure, and feasibility present significant hurdles. Balancing innovation with practicality is essential to effectively harnessing technology to support language learning and ensuring the future viability of Maltese in the digital age.

### 3.3 Ġabra online dictionary limitations

The online dictionary *Ġabra*, a staple resource for Maltese language teachers, has been identified with significant limitations. Teacher 5 highlighted, "We rely on Ġabra a lot, but it lacks pronunciation guides, which is a big drawback." Similarly, Teacher 18 emphasised, "The absence of pronunciation guides in Ġabra poses a significant challenge. Students need accurate pronunciation guidance to learn and use Maltese effectively." Supporting this sentiment, Teacher 10 noted, "Pronunciation is crucial, especially for non-native learners. Ġabra's lack of this feature undermines its utility in the classroom."

In contrast, Teacher 25 provided a different perspective, suggesting, "While Ġabra's pronunciation feature would be beneficial, its comprehensive database and detailed definitions are still valuable. It remains an indispensable tool despite its limitations." Teacher 29 echoed this sentiment, by stating, "Ġabra may not be perfect, but it's one of the few resources we have that offers detailed explanations and examples. We've learned to work around its shortcomings." Moreover, Teacher 14 proposed a solution-oriented approach, saying, "We should advocate for improvements in Ġabra's functionality, including adding pronunciation guides. It's time to enhance our digital resources to better support Maltese language learning."

These participants recognised Ġabra's importance as an online dictionary for teaching Maltese, however, there was a consensus on the need for enhancements, particularly in providing pronunciation support. Addressing these limitations is crucial for improving the efficacy of digital tools in supporting Maltese language education and ensuring comprehensive language learning experiences for students.

 

### 3.4 Challenges with AI

Twenty-eight teachers also reported significant challenges with AI tools designed for teaching Maltese. Teacher 11 pointed out, "Sometimes AI generates non-existent words in Maltese, which confuses the students." Similarly, Teacher 27 shared a similar experience, stating, "AI is not always reliable for Maltese. It often comes up with incorrect translations or made-up words." Teacher 20 agreed with these concerns, adding, "The inaccuracies in AI translations can lead to misunderstandings and errors in students' Maltese language learning process. It's frustrating when technology designed to assist ends up confusing." However, Teacher 26 provided a nuanced perspective, by suggesting, "While AI has its flaws, it can still be a valuable tool if used correctly. Teachers need to guide students on how to verify and critically assess AI-generated content."

#### *3.4.1 Using English for creative writing aids*

Another significant challenge identified by teachers is the necessity of using English-centric AI tools for activities in Maltese classes. Teacher 15 explained, "We often ask students to use AI to find pictures for their creative writing, but they have to input their queries in English. This doesn't make sense when we're trying to immerse them in Maltese." Teacher 30 echoed this frustration, stating, "Using English as a medium undermines our efforts to promote the Maltese language and culture in the classroom. It's counterproductive and disappointing." Teacher 9 shared a similar sentiment, saying, "Students should be able to engage with AI tools in Maltese to fully integrate technology into our language teaching methods. This current reliance on English limits their learning experience." On the other hand, Teacher 24 offered a pragmatic perspective, by acknowledging, "While it's not ideal, sometimes we have to work with what's available. Integrating more Maltese-friendly AI tools should be a priority, but in the meantime, we must find ways to adapt and supplement."

While AI technology offers potential benefits for language learning, the challenges of accuracy and language integration persist for teachers of Maltese. Addressing these issues is crucial to harnessing technology effectively in supporting Maltese language education and fostering a deeper cultural understanding among students.

### 3.5 Integration into educational technologies

The integration of Maltese into mainstream educational technologies emerged as a significant concern among 32 teachers. Teacher 3 noted, "Educational platforms often support multiple languages but rarely include Maltese. This limits our ability to use these technologies effectively." Similarly, Teacher 19 concurred, stating, "We need better integration of Maltese into widely-used educational tools. It's essential for providing a comprehensive learning experience." Teacher 6 expanded on this point, by emphasising, "When educational technologies exclude Maltese, it creates barriers for both teachers and students. We need inclusive platforms that cater to the linguistic diversity of our classrooms."

However, Teacher 14 offered a different perspective, suggesting, "While integration is important, we should also consider developing specific tools and resources designed specifically for teaching Maltese. This targeted approach could address our unique educational needs more effectively." Teacher 25 provided a pragmatic viewpoint, stating, "Improving integration is a step in the right direction, but it requires collaboration between educators, developers, and policymakers to ensure that Maltese is not overlooked in the digital education landscape." Additionally, Teacher 32 highlighted the broader implications of inadequate integration, saying, "When educational technologies neglect Maltese, it perpetuates the marginalization of our language and culture. We must advocate for equitable access to digital resources for all languages."

Therefore, while these teachers agreed on the urgent need for better integration of Maltese into educational technologies, there were diverse perspectives on the strategies and approaches to achieve this goal. Addressing these challenges requires systemic changes and collaborative efforts to ensure that Maltese language education is supported and enhanced in the digital age.

### 3.6 Community and cultural preservation

Despite the challenges identified, all 34 teachers emphasised the potential of Computer-Assisted Language Learning (CALL) in fostering a sense of community among learners and preserving Maltese cultural heritage. Teacher 7 commented that CALL "can help connect learners and native speakers, creating a community that supports each other. It's not just about learning the Maltese language; it's about nurturing a connection to our cultural roots."

Teacher 25 echoed this sentiment, stating, "By leveraging technology, we have an opportunity to preserve our cultural heritage and ensure that Maltese continues to thrive for future generations. Technology can be a powerful tool in this endeavour." Teacher 16 agreed with these perspectives, highlighting, "Technology allows us to reach Maltese speakers globally, strengthening our cultural identity and sense of belonging. It's about uniting our community through language and shared experiences." In contrast, Teacher 29 expressed caution, noting that while CALL "offers connectivity, we must ensure that it does not dilute the authenticity of our cultural practices. Preserving traditions alongside language is equally important."

Teacher 12 offered a practical insight, by suggesting that CALL "can supplement traditional methods of cultural transmission, by offering new avenues for engagement and learning. It's about striking a balance between innovation and tradition." Moreover, Teacher 18 emphasised the role of education in cultural preservation, stating that through CALL, "we can teach not only the language but also the values and traditions embedded in Maltese culture. It's a holistic approach to ensuring our heritage endures."

In general, while CALL presents opportunities for fostering community and preserving Maltese culture, the participants recognised the need for thoughtful integration and balanced approaches to maximise its benefits in language education. Addressing these considerations is vital to safeguarding the rich cultural heritage associated with the Maltese language in the digital age.

These findings underscore the urgent need for more tailored digital resources and better integration of Maltese into educational technologies. While current CALL tools provide a foundation, significant improvements are necessary to fully support the teaching and learning of Maltese. Addressing these challenges is crucial for preserving and revitalising the Maltese language in the digital age, ensuring it remains a vibrant and integral part of Malta's cultural heritage.

## 4. Discussion

The findings from the interviews with Maltese language teachers shed light on several critical challenges facing CALL in the context of teaching Maltese. These challenges resonate with broader discussions in the field of educational technology and language learning, as evidenced by studies and scholarly insights.

The consensus among teachers regarding the scarcity of interactive digital resources tailored for Maltese mirrors findings in other language education contexts. Żammit (2024) similarly discusses the inadequacy of digital tools for supporting Maltese language learning, emphasising the need for innovative solutions to engage students effectively. The discrepancy between the availability of digital resources for widely spoken languages versus minority languages like Maltese underscores a systemic issue in educational technology development (Żammit, 2023).

While some teachers advocated for simplicity in teaching methods supplemented with technology, others argued for the necessity of interactive apps and games to engage contemporary learners. These perspectives align with current debates in CALL literature, where the balance between traditional pedagogical approaches and technology-enhanced learning experiences is continuously explored (Levy & Stockwell, 2006).

The absence of VR and AR games for learning Maltese reflects broader global trends in educational technology adoption. Weng et al. (2024) discuss the potential of immersive technologies like VR and AR in enhancing language learning experiences, highlighting their effectiveness in other language contexts. However, the practical

challenges such as cost and infrastructure identified by teachers in this study resonate with Abid et al. (2022), emphasising the need for sustainable and scalable implementations of these technologies in language education.

Similarly, the concerns raised about AI tools generating inaccuracies and relying on English-centric interfaces align with current critiques in AI-assisted language learning. Some current studies underscore the importance of AI tools in language education while acknowledging the need for improvements in accuracy and language integration specific to less-resourced languages (Moorhouse & Kohnke, 2024). These studies highlight the potential of AI to enhance language learning but also caution that its effectiveness is limited in the context of minority languages like Maltese, where tools often fail to address linguistic nuances and specific cultural needs.

The call for better integration of Maltese into mainstream educational technologies resonates with broader discussions on linguistic diversity and educational equity. Żammit's (2024) exploration of CALL's role in supporting linguistic diversity underscores the necessity of inclusive educational platforms that cater to the needs of minority languages. The findings from this study underscore the urgent need for policy interventions and collaborative efforts to ensure equitable access to digital resources for all languages, including Maltese.

Furthermore, the participants' perspectives on CALL's potential to foster community and preserve Maltese cultural heritage align with scholarly discussions on the role of technology in cultural sustainability. Kim (2020) highlights how CALL can facilitate connections among language learners and native speakers, contributing to the preservation and transmission of cultural knowledge. The balanced approach advocated by teachers resonates with García, et al. (2017) emphasis on integrating technology with traditional cultural practices to ensure authenticity and relevance.

The challenges identified by the Maltese language teachers in this study underscore the complexities and opportunities inherent in integrating CALL into Maltese language education. These findings align with current scholarly debates and highlight the urgent need for tailored digital resources, improved integration of Maltese into educational technologies, and strategic use of technology to preserve its cultural heritage. Addressing these challenges requires collaborative efforts among educators, policymakers, and technologists to ensure that Maltese language education remains vibrant and relevant in the digital age.

## 5. Conclusions

The findings from this study provide useful insights into the challenges and opportunities of integrating CALL in the context of teaching Maltese. Through the interviews with 34 Maltese language teachers, several key themes emerged, highlighting critical areas for improvement in digital resources, educational technologies, and cultural preservation efforts.

Firstly, the study underscores the pressing need for more interactive digital resources tailored specifically for teaching Maltese. Teachers unanimously expressed their frustration over the lack of engaging apps and games that could effectively motivate students. This echoes broader discussions in educational technology, emphasising the importance of innovative and interactive learning tools to enhance student engagement and learning outcomes. Secondly, the absence of VR and AR applications designed for learning Maltese presents a significant gap in current educational technology offerings. While teachers recognise the potential of these immersive technologies to revolutionise language learning, practical barriers such as cost and infrastructure remain formidable obstacles. Thirdly, the study highlights the limitations of existing AI tools for teaching Maltese, particularly concerning accuracy and integration with the language's unique features. Teachers expressed concerns about AI-generated content that often lacks contextual accuracy and relies on English-centric interfaces, hindering its effectiveness in supporting language learning. The integration of Maltese into mainstream educational technologies emerged as another critical concern among teachers. The study advocates for policy interventions that promote inclusive digital platforms capable of supporting linguistic diversity. This aligns with broader efforts in educational policy to ensure equitable access to educational resources for all languages, thereby safeguarding linguistic and cultural diversity.

Furthermore, the study underscores CALL's potential to foster community among learners and preserve Maltese cultural heritage. The teachers emphasised the role of technology in connecting Maltese speakers globally, nurturing a sense of cultural identity, and transmitting cultural values alongside language skills.

**Limitations of the study**

Despite its contributions, this study is not without limitations. The sample size of 34 Maltese language teachers may not fully represent the diversity of perspectives within the educational community. Future studies could benefit from larger and more diverse samples to capture a broader range of experiences and insights.

The study primarily relied on qualitative interviews, which provide rich contextual data but may limit generalizability. Combining qualitative findings with quantitative measures could offer a more comprehensive understanding of the challenges and effectiveness of CALL in Maltese language education.

This study focused on current challenges and opportunities without delving deeply into the longitudinal impacts of integrating CALL in Maltese classrooms. Future research should explore the long-term effects of digital technology adoption on language proficiency, cultural preservation, and educational outcomes over extended periods.

**Further Studies**

Building on the findings of this study, future research directions are suggested to advance the field of CALL and support efforts to preserve the Maltese language and culture in the digital age. Longitudinal studies are recommended to assess the sustained impact of digital technologies on Maltese language learning outcomes and cultural preservation. Additionally, comparative studies should investigate the effectiveness of various digital resources, such as interactive apps, VR / AR, and AI tools, in enhancing student engagement and language proficiency across diverse linguistic contexts.

Policy and implementation studies are needed to explore how educational policies and institutional frameworks can facilitate the integration of CALL for minority languages like Maltese, emphasising equity and accessibility. Furthermore, employing user-centred design approaches is crucial to developing and evaluating digital resources that cater specifically to the needs of Maltese language learners and educators. Addressing these research gaps will not only contribute to the advancement of CALL but also support ongoing efforts to preserve and promote the Maltese language and culture. This study underscores the importance of targeted interventions and collaborative initiatives in leveraging educational technology for the benefit of Maltese language education and cultural preservation.

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# Use of digital learning materials for inclusive education

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***Abstract***

*This paper introduces a case study of the effects of a digital textbook called "Multimedia DAISY textbook" for a student with learning difficulty. A multisensory material called "DAISY" is considered to be ideal for educating students with learning difficulties. In Japan, DAISY has been helpful for students with learning difficulties, especially when they study in regular classes, trying to keep up with their classmates. The number of DAISY users has been increasing. According to the survey, in 2023, 24,560 students used DAISY in Japan. DAISY is expected to become more prevalent among and familiar to students with learning difficulties, their parents, and the schools they attend. In this case study, a junior high school student with reading difficulties studied English via DAISY for about a year. Through the interview, it was found that DAISY helped the student not only increase his test scores but also his self-esteem and motivation to study English. The results of the case study suggest that to achieve a truly inclusive education system, it is essential to help students with learning difficulties to keep up with classes, gain confidence in their learning and improve their self-esteem by providing them with individualized support they need.*

***Keywords:*** *English language learning; digital textbook; learning difficulties; inclusive education.*

## 1. Introduction

The United Nations Convention on the Rights of Persons with Disabilities (CRPD) was adopted in December 2006. The Convention clearly states that persons with disabilities must not be excluded from the general education system based on their disability. Moreover, the Convention includes ensuring an inclusive education system at all levels and enabling people with disabilities to participate effectively in a free society (United Nations, 2006). In other words, inclusive education is essential for realizing an inclusive society. To achieve a truly inclusive education system, it is essential to help students with disabilities or learning difficulties keep up with classes, gain confidence in their learning, and improve their self-esteem by providing them with effective individualized support.

According to a survey conducted by the Ministry of Education, Culture, Sports, Science, and Technology (MEXT) in 2022, about 8.8% of students with possible developmental disabilities are enrolled in public elementary and junior high schools in Japan (MEXT, 2022). Compared with 6.5% from the last survey in 2012, this result represents an increase of 2.3% over the past decade. One reason for this increase is that society has become more aware of students with disabilities, and parents and teachers are paying more attention to them. In today's information society, an increasing number of students, parents, and teachers are becoming aware of their disabilities and are looking for better learning environments. Burgstahler (2020) claims that "the total number of students who disclose their disabilities and receive accommodations continues to increase at a fast rate" (p. 6).

 

Inclusive education, in which students with disabilities learn together with other students in regular classes, is gradually gaining recognition and promotion in Japanese public elementary and junior high schools. However, as students advance through school grades, the content of their studies becomes more difficult, and many students have difficulty keeping up with regular classes and eventually end up studying in special needs classes apart from their classmates. In particular, an increasing number of junior high school students have difficulty learning English. Just placing students with disabilities in the regular classroom is not sufficient to realize true "inclusive education." Inclusive education means that students with disabilities in regular classrooms can fully participate in learning with the support they receive (Muzata, 2023). ICT and digital materials are expected to play an important and effective role in providing individualized support.

This case study suggests that a digital learning material, called "Maultimedia DAISY Textbook (DAISY)" can be one of the supports for such students. The subject of this study, a junior high school student, also had difficulty reading English and took a long time to read. Because he attended regular classes, he had to take mid-term and final tests together with his classmates each semester. Therefore, to compensate for his reading difficulties, he started using DAISY for English learning at home to review what he had already learned in class. Through this case study, his test results and interviews are examined to see what changes learning English with DAISY has brought to him. It will also be examined whether digital materials such as DAISY are an effective and necessary individualized support for students like him who study in a regular classroom

## 2. Methods

### 2.1. Multimedia DAISY textbook

"DAISY" stands for "Digital Accessible Information System," a specification and system for producing digital audiobooks. It is an international standard for digitally recorded books developed and maintained by the Swiss-based DAISY Consortium (2024). The Multimedia DAISY Textbook is a type of digital audio material that is mainly intended for students who have difficulty recognizing texts and graphics used in regular paper textbooks because of visual impairment, developmental disabilities, learning disabilities, and other factors. In Japan, DAISY is provided by the Japan Society for the Rehabilitation of Persons with Disabilities (JRPD) on a volunteer basis and can be used free of charge by students with disabilities or difficulties (JRPD, 2024).

DAISY contains texts, images, and sounds. These features make DAISY a multisensory material considered ideal for educating students with difficulties. Moreover, the reading speed and font size can be changed, and this variety of options is suitable as learning material for students with reading difficulties. In addition, the text being read can be highlighted, making it easier to follow. The benefits of simultaneous presentation of audio and text and highlighting of text were observed not only for students with reading and writing disabilities but also for students without disabilities (Okumura, 2011). Therefore, DAISY is considered to have a universal benefit, showing effectiveness regardless of whether a student has a reading disability.

In Japan, Multimedia DAISY Textbooks have been available for students with difficulties, such as dyslexia, visual impairment, and learning difficulties since 2008. Textbooks are now available in many fields, including Japanese, English, math, science, social studies, and home economics. In addition, students from elementary to high school are now able to use DAISY. In recent years, the number of users has significantly increased. According to a survey by the JSPRD (2024), 952 students used DAISY in 2012. A decade later, in 2023, 24,560 students are reported to have used it (Figure 1).

 

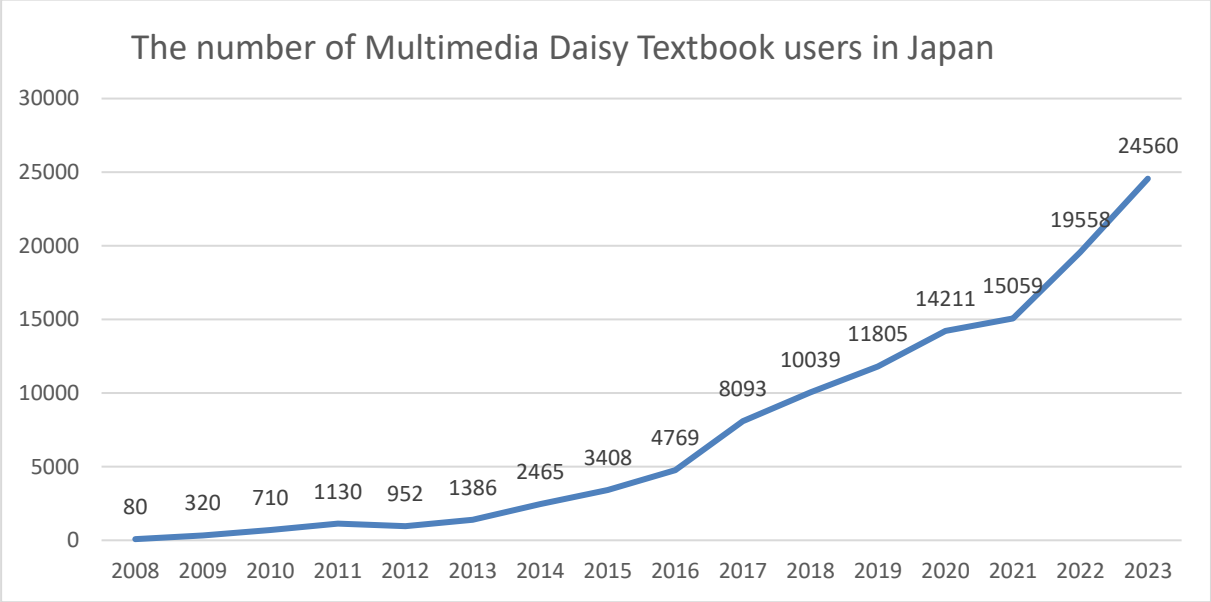


Figure 1. The number of Multimedia Daisy Textbook users in Japan (JSPRD, 2024).

### 2.2. Participants

The subject of this study, a junior high school student, had difficulty learning, especially when reading both Japanese and English. He attended a regular class rather than a special needs class. He and his family hoped that he would take classes with his friends as he did in elementary school. Inclusive education provided him with enough time to spend with his friends in and out of the classroom and an opportunity to participate in a club activity after school. However, he had difficulty keeping up with his English classes because he had difficulty reading conventional paper-based textbooks. However, he was often able to understand the content when family members or teachers read the textbooks. Therefore, DAISY, especially its audio function, was expected to help him learn English. To compensate for his reading difficulties, the student started to learn English using DAISY on his tablet at home. In 2017, he started studying English at home using DAISY for 20 minutes every other day. Initially, his family taught him how to use these devices. However, within a few weeks, he became accustomed to using DAISY and began learning independently. He learned English using his tablet, adjusted the reading speed, and enlarged the text. He primarily used DAISY to understand texts. He first listened to DAISY, read the passages, and then read each sentence aloud following the highlight. Before the test, he tried to memorize vocabulary by listening to DAISY and learning pronunciation and spelling as well.

### 2.3. Interview

An interview was conducted with him one year after he started learning English using DAISY. The content of the interview was his feelings about learning English and his impressions of using DAISY to study English.

## 3. Results

One year after he began studying with DAISY, his scores increased by 30 percent on the final exam. In an interview, he said, “Unlike the paper textbooks, I can follow where the DAISY is reading because the texts are highlighted.” He also commented, “Thanks to the highlighting, I can see where I am reading, so it is easy to read. In addition, the playback speed can be lower, it is easier to listen to, and the text can be enlarged and is easier to read.” His feedback during the interview indicated that studying English on DAISY helped him increase not only his test scores but also his motivation to study English. Since graduating from junior high school in 2020, the subject of this study has been studying English with applications on his smartphone for approximately 10 minutes every day.

 

He uses the applications to autonomously learn practical English, including grammar, vocabulary, and everyday conversation. These results suggest that technology-enhanced learning can lead to lifelong learning.

Moreover, in addition to improving his English language learning, he became more familiar with ICT and technology because he made use of a tablet every time he learned English via DAISY. ICT and digital technologies can be not only helpful aids for learning but also essential tools for students with disabilities to live in today's information society. As Burgstahler (2020) points out, "People with disabilities have a long history of less access to information, technology, places, and services than that of other people" (p. 7). Therefore, they need to become familiar with digital technologies while still attending school. Furthermore, students need to become familiar with English and digital technologies to increase their independence and social participation after graduation. That is why, learning English can be an ideal way for students to learn how to use digital technology.

One difficulty, however, he experienced during the independence study through DAISY was acquiring a firm grasp of grammar, such as third person singular and tenses. He was able to understand the content by listening to DAISY's audio, or repeating and reading the text aloud, but was not able to pay attention to the details. It is considered necessary to supplement grammar learning with other teaching materials.

## 4. Discussion

All students with or without disabilities need to become familiar with both English and digital technologies to increase their independence and social participation after graduation. This case study examined the effects of the digital textbook called DAISY for a student with learning difficulty who is learning English as a foreign language in Japan. His test scores increased after studying English in this digital textbook for approximately one year. Furthermore, since he started using DAISY to study English, he has always preferred to study English using the digital textbook or applications on his smartphone over conventional paper textbooks. This case study revealed that learning through digital materials are helpful and effective for students experiencing learning difficulties.

Saito (2023) pointed out that ICT can improve the quality of student learning. Not only DAISY, but other materials such as applications, or other digital technologies should be very effective for many students who experience difficulties in learning. I hope that DAISY will become more prevalent and familiar to students with disabilities or learning difficulties, as well as parents and teachers. They are helpful aids for students to keep up with their classes, contributing to the realization of inclusive education.

## 5. Conclusions

In Japan, the number of special needs classes and schools has increased in recent years (MEXT, 2019). Possible reasons for this include generous care in small classes, vocational training for employment, access to a well-thought-out curriculum, and guidance from teachers who are experts on special needs. Therefore, many students and parents understandably choose special needs classes or schools. However, many students with disabilities and learning difficulties prefer to learn in their local schools with neighborhood friends through inclusive education in regular classrooms. In such cases, teachers and schools must be prepared to welcome those students with individualized and optimal education to develop their academic skills and abilities to the fullest. This means not only equipping classrooms with technology devices, but also researching, developing, and building effective teaching methods using digital materials and ICT.

This case study suggests that digital learning materials such as DAISY can be one of the supports for such students. The feedback during the interview with the subject of this case study indicated that studying English on DAISY helped him increase not only his test scores but also his motivation to study English. Moreover, in addition to improving his English language learning, he became more familiar with ICT and technology because he made use of a tablet every time he learned English via DAISY. The results of this case study suggest that digital learning materials such as DAISY can be an effective and necessary individualized support for students with learning difficulties who study in a regular classroom. In order to achieve a truly inclusive education, it is essential to help

 

students with learning difficulties to keep up with classes, gain confidence in their learning and improve self-esteem by providing them with effective individualized support they need.

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# Synchronous and asynchronous learning

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# Engaging young learners in synchronous English learning with SDGs lessons

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***Abstract***

*The benefits of technology-enhanced language learning have been advocated by researchers and educators. The use of new technologies can positively contribute to English learners' learning skills and enhance their overall proficiency. As technology plays an important role in getting access to authentic English-speaking communities and broadening students' international perspectives, this study set out to explore how to design synchronous English teaching and learning lessons to engage young learners in the United Nations' Sustainable Development Goals (SDGs) lessons. In this paper, the researchers explored the topic: How to design bilingual tutoring lessons and materials to engage elementary school students in learning English. Ten lessons, covering ten SDGs, were designed. In each lesson, an English picture storybook was used as a literacy development lesson. Extended activities then covered SDGs discussion. Selected video clips of tutoring sessions were presented. Findings show engaging students' emotional experiences in English learning and cognitive development is imperative. This study has important implications for theory and practice. From a theoretical perspective, technology resources can indeed enhance authentic English learning. Picture storybooks can increase learners' learning motivation and facilitate their literacy development. This study suggests that with special attention on comprehensible input, structured task activities and controlled practice activities, the instructors can help young learners comprehend the ideas of SDGs lessons better.*

***Keywords:*** *computer-assisted language learning; Sustainable Development Goals (SDGs); synchronous tutoring; teaching English to young learners; technology-enhanced language learning.*

## 1. Introduction

The benefits of technology-enhanced language learning (TELL) have been advocated by researchers and educators. A 2023 meta-analysis study (Nurmala et al, 2023) investigating the effectiveness of TELL in the context of English language teaching, highlights that the use of new technologies positively contributes to learners' language learning skills and enhances their overall proficiency. The findings underscore the importance of technology in enhancing language learning outcomes and emphasize the need for ongoing support and professional development for teachers in integrating technology into language teaching. Studies on language teacher education find that teachers continue to feel underprepared to use technology and more research is needed on the types of learning experiences educators need in order to implement digital tools for language

 

teaching and learning. As technology plays an important role in getting access to authentic English-speaking communities and broadening students' international perspectives, this study set out to explore how to design synchronous English teaching and learning lessons to engage students in universal topics: SDGs lessons. It gives examples of lessons in a synchronous English learning project for elementary students.

With the advent of technology, E-learning platforms can help provide not only synchronous audio interaction but also synchronous face-to-face interaction. With the development of video conferencing and similar platforms, distance teaching and learning processes can take place synchronously with live lessons (Kentnor, 2015). Empirical studies have shown that the interactions between the instructor and student can increase student motivation for learning and can contribute to their success in online courses (Alqurashi, 2016; Rodriguez & Armellini, 2017). Recent studies have pointed out that for online lessons to be successful, both students and teachers must have appropriate digital skills (e.g., Salta et al., 2021; Tejedor et al., 2020) and appropriate technological means (e.g., computers, laptops, Wi-Fi, etc.).

Since the United Nations adopted the 17 Sustainable Development Goals (SDGs) in 2015 (United Nations, 2015), programs and curriculum all around the world have been proposed to educate the students to cope with the major environmental, social and economic problems worldwide (e.g., Hurd & Ormsby, 2020; Saini et al, 2023). The education system has an important role in raising awareness of the SDGs and in teaching skills and values that lead to more sustainable behavior (Kleespies & Dierkes, 2022). The United Nations Educational, Scientific and Cultural Organization (UNESCO) has developed learning objectives for the SDGs to support teachers and learners (UNESCO, 2017). As Kleespies and Dierkes (2022) indicate, students, as potential future decision-makers of society, contribute greatly to the achievement of the SDGs and they have a great impact on the major problems of humanity as well as the future of our planet.

Kleespies and Dierkes (2022) conducted a survey, in which they asked 4,305 university students whose stdies are related to environmental and sustainability studies from 41 countries to rate how important the 17 SDGs are. The researchers indicate that it is not sufficient to teach only basic scientific knowledge; rather, other factors, such as attitudes or values, should also be a particular focus of education. Moreover, the importance of the SDGs should be considered not only for specific countries but also in an international and global context. Thus, as suggested, these topics can be integrated into the curricula of universities and schools to enable students to act as multipliers and to pass on the importance of the SDGs in societies. All the researchers and educators have been endeavouring to address these global issues and to create a more sustainable and better future for all. Therefore, it is particularly important regarding how the SDGs are perceived, accepted and practiced by people worldwide.

Few studies have explored how to engage young learners in learning with SDGs lessons. This study is an attempt to reduce the research gap. In line with the international trend and the UNESCO advocate, it set out to guide university students to design SDGs lessons embedded in English learning lessons to tutor young learners. The aim is to promote SDGs awareness from an early start. The results of this study are intended to provide guidance for action for teachers and student teachers as well as teacher educators.

## 2. Background

In this globalization era, teaching and learning English as a lingua franca is emphasized. In Taiwam, in order to increase our citizens' global communication competence and international perspectives, in December 2018, National Development Council (2018) has launched the Bilingual 2030 Policy precisely to boost the competitiveness of Taiwan's young generation to enable the next generation to enjoy better job and salary opportunities. Since 2018, bilingual granted projects and curricula have been practiced. Moreover, bilingual activities for young learners to engage in English learning and for teachers to pursue professional development have been a focus during the past few years. Accordingly, preparing pre-service and in-service teachers to cope with bilingual education is incredibly imperative in Taiwan.

The Bilingual Digital Learning Project is one of the funded projects by Ministry of Education in Taiwan. More information regarding the project can be found on the website: https://etutor.moe.gov.tw/bd/index.php. As stated

on the project website, this project was proposed in accordance with the 2030 Bilingual Policy as well as the Law of National Language Development. This project calls for proposals from universities. Currently, there are twenty-five universities receiving the grants and there are 193 schools (152 elementary schools and 41 junior high schools) participating in the project.

The curricula in Bilingual Digital Learning Project are delivered bilingually through the digital learning platform, Teams. The curriculum has to be organized and designed thematically, focusing on the Nineteen Issues in *the Curriculum Guidelines of 12-year Basic Education* in Taiwan. Each university, after receiving the grant, then designs their own curricula, integrating important global issues and local issues, to align with Sustainable Development Goals. The project aims to provide a bilingual digital learning environment and to support the development of digital curricula for bilingual education in Taiwan. The purpose of the bilingual project is to increase students' motivation and interests in learning English through online tutoring and to create a diversified bilingual learning environment for children.

## 3. Method

### 3.1. Context and participants

The bilingual digital learning project commenced in Fall 2022, launched by the Ministry of Education in Taiwan. In the project, universities submitted proposals to compete for grants to synchronously tutor elementary school students or junior high school students. After receiving the grant, universities then recruit university students to participate in the tutoring project. Elementary schools and junior high schools, after receiving the call for projects, submitted their proposal for the grant. The purpose of the afterschool program is to bridge the gap between urban and rural English education in Taiwan. In the project, the tutoring materials are prepared by the university tutors; the material content should cover the *Nineteen Important Issues* in Taiwan's *Curriculum Guidelines of 12-Year Basic Education*. *The Nineteen Important Issues* are topics similar to the UN Sustainable Development Goals.

In this study, there were 114 tutees from 11 elementary schools, assigned by the Ministry of Education. Tutees were recruited by each school, ranging from grade 3 to grade 6 (aged 9 to 12 years). Twenty-seven tutors were recruited. They were the university students and graduate students in an English department. This project used the Microsoft Teams online learning platform to deliver the lessons. The real-time online bilingual program was offered two sessions a week. Each session lasted for 90 minutes with a 10-minute break. A snapshot of the synchronous online tutoring of the tutors in the university classroom is shown in Figure 1.

Figure 1. A snapshot of the tutors in a university classroom.

 

Figure 2 is a snapshot of the students receiving the tutoring from one of the elementary schools in this project. During the tutoring, one teacher is onsite to manage the tutees' classroom and to assist their learning.

Figure 2. A snapshot of the tutees in their classroom.

### 3.2. Sample lessons

The online lessons in this project were designed by the tutors with the guidance and consultation of the researchers. Each lesson was equipped with PowerPoint slides and worksheets as well as online activities on Wordwall and Nearpod. Youtube videos were also incorporated into the lessons. Each week, a picture storybook, either an e-book or a paper-book, was introduced to facilitate students' English literacy development. The tutors then incorporated online resources to design the lesons. A sample lesson of the selected PowerPoint slides for guiding students to do a discussion is presented in Figure 3. The topic is: Let's talk about pets. The embedded SDGs is Goal 4: Quality Education.

The book used in this lesson is *Big Cat, Little Cat,* a picture book written by Elisha Cooper (2017) with a 2018 Caldecott Honor. In the story, a big, white cat welcomes a new black cat into a family. Over the course of the story, the two cats age, until the white cat dies. The cycle begins anew when the family adopts a new black kitten. The PowerPoint slides show the text and sample pages of the story. Guided reading activities were used. After reading the storybook, extended activities for discussion were provided. The first extended activity was for the tutees to look at some pet photos from our tutors. They observed how these pets behaved. The pet behaviors were captured, similar to the behaviors of the cat in the storybook. Video clips of the tutors' pets (cats, birds and bunnies) were made for this lesson. Tutees then voted the pets they loved and shared their opinions.

 

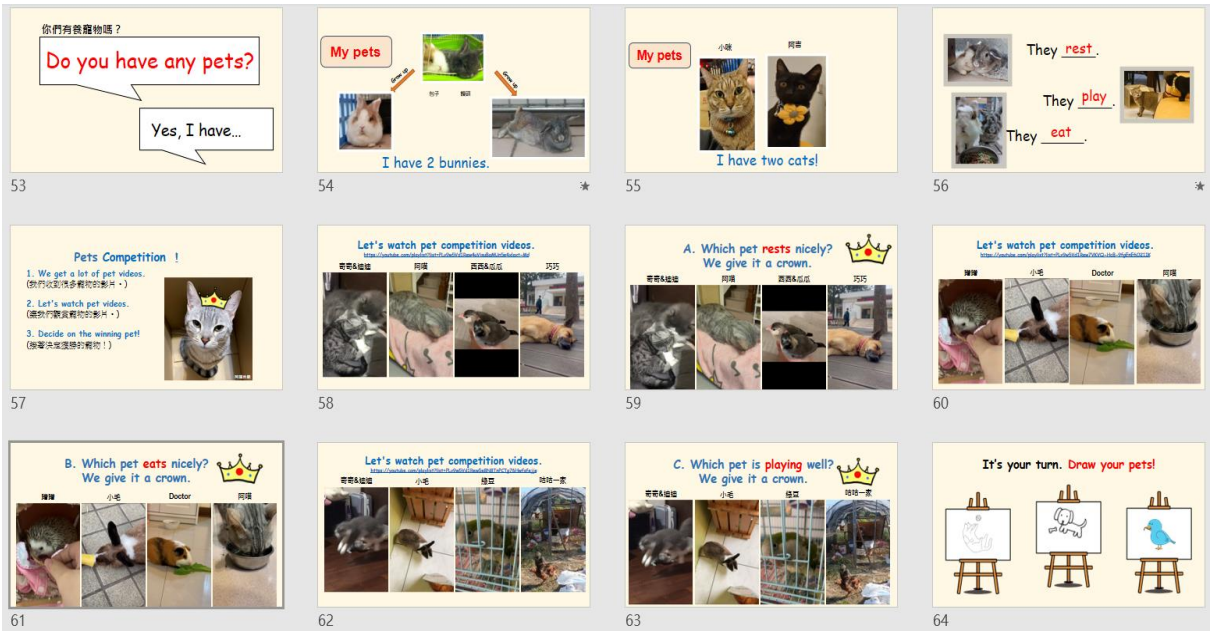


Figure 3. A sample lesson with PowerPoint slides.

The second extended activity for discussion then guided the tutees to think about how to take care of a pet and how to keep the pet as a family member. They responded their ideas on Nearpod. See Figure 4 for the activity.


Figure 4. A discussion activity.

Figure 5 presents a second leeson, also embedded with SDGs Goal 4: Quality Education. The story is about a proverb, invented from a legend from the Chinese story—*The Lost Horse*. The text and illustration in Figure 5 were created by one of the tutors in this project. He adapted the text from Ed Young's (2004) *The Lost Horse*, accompanied by the illustration.

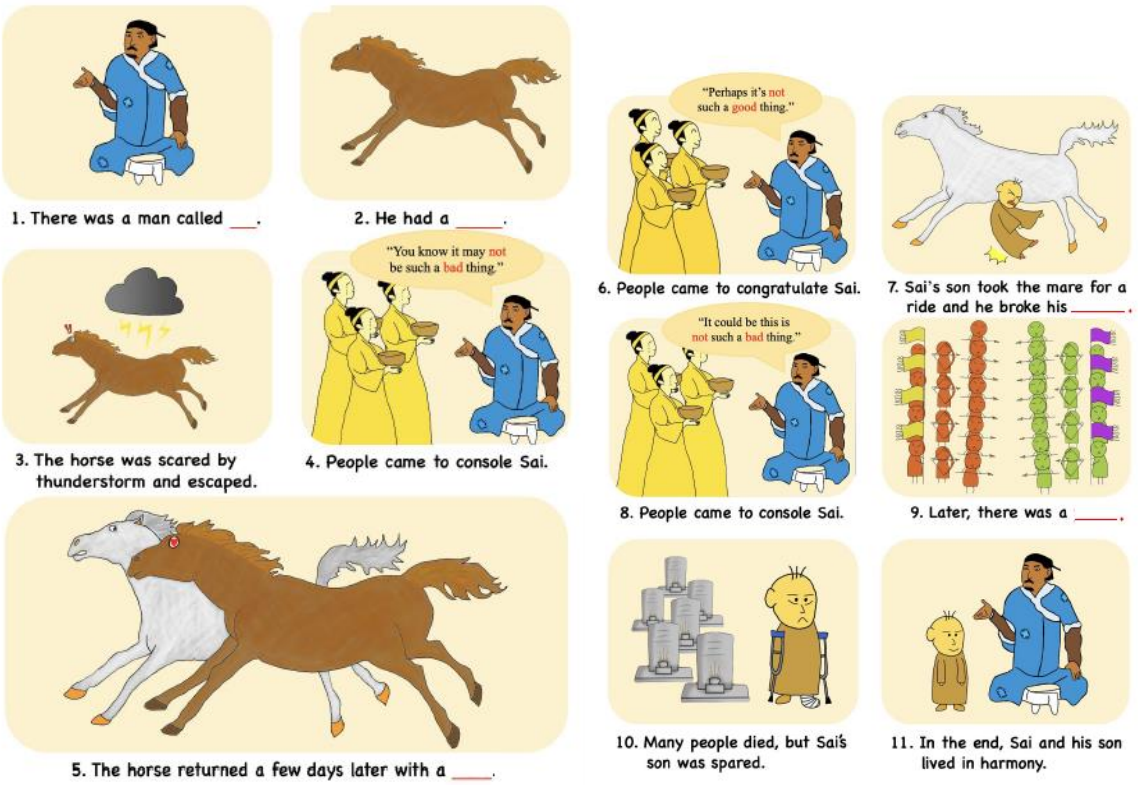


Figure 5. A worksheet of the story: *The Lost Horse*, illustrated by one tutor in this project.

This lesson guided the tutees to make meaning of the loss in life. Instead of judging something as "good" or "bad," the story tells the readers to accept it as it is. Good luck and bad luck create each other, and it is difficult to foresee their change. In summary, bad luck brings good luck, and good luck brings bad luck. In this lesson, the extended activity then guided the students to illustrate an ending on Nearpod to show how they comprehended the meaning of the story.

In this bilingual online tutoring project, Nearpod was used most often. It can be seen in almost every tutoring lesson. Nearpod is a platform for interactive lessons, videos, and assessments to engage students in various learning environments. The purpose of using this online platform was to equip tutees to be familiar with online technology skills and to share thie ideas online.

Figure 6 presents a sanpshop of 5 tutees' drawing skills on Neapod in a group. After they read *The Lost Horse*, they were creating their own ending. They were illustrating the last scene of the story: In the end, Sai and his son lived in harmony.

 

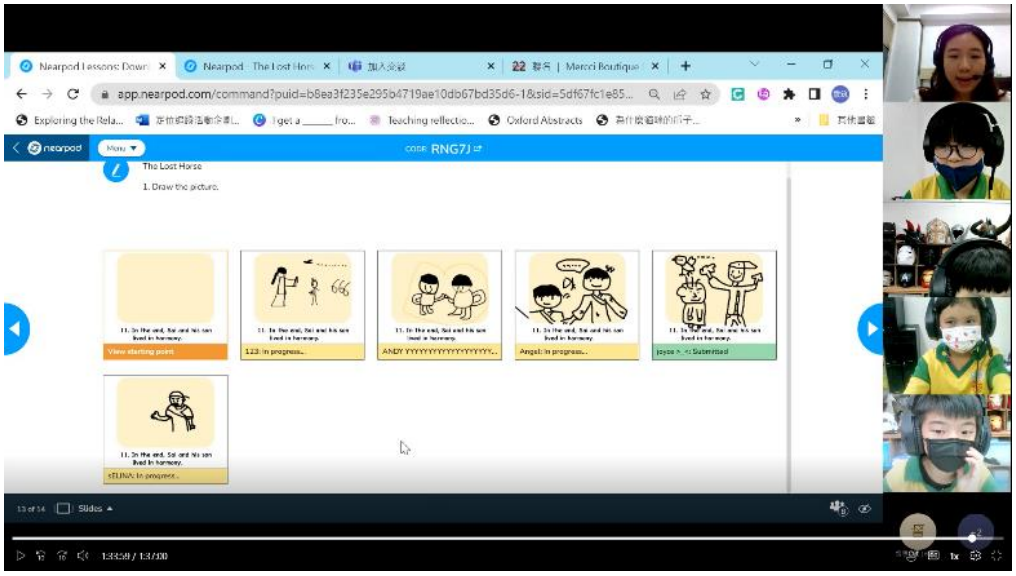


Figure 6. A snapshot of tutees' illustrations on Nearpod.

## 4. Results and discussion

A questionnaire was administered at the end of the project. Data were collected from 114 tutees. The questionnaire was composed of eight items of a 5-point Likert scale. Students were asked to rate their opinions on a scale of 1 to 5, with the questions presented in a vertically aligned checkbox format. The rating scale was defined as follows: 1 represented "strongly disagree," 2 signified "disagree," 3 denoted "neutral," 4 indicated "agree," and 5 signified "strongly agree." Each question is written in the students' native language.

Figure 7 presents the means of the eight items. Seven items out of eight achieved a mean above 4, indicating that tutees were attentive during class, participated in activities with efforts, found lessons interesting, found lessons beneficial to their English learning, felt interested in learning English, improved their listening ability, improved their speaking ability, and loved reading English stories.

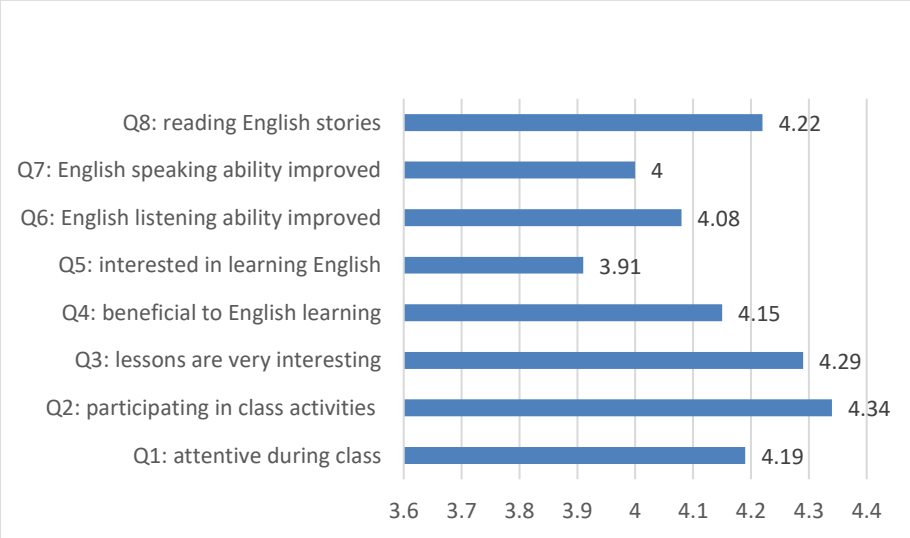


Figure 7. Tutees' perspectvies on the project.

In addition to the Likert scale items, an open-ended section was provided at the end of the survey, inviting students to offer comments on the project. This section allowed for responses in either English or Mandarin Chinese, catering to students' linguistic preferences. The qualitative data were examined using thematic analysis,

informed by Huberman and Miles's (2002) constant comparative method. Examining all the students' written statements of the questionnaire, the researchers found some prominent themes. They are: they loved the activities or games in the lessons, they learned a lot of knowledge, they liked the lessons, the lessons were interesting, the lessons helped them learn English, they hoped to join next semester, and they expressed their gratitude to the tutors. Selected sample statements are as follows:

I think this program helped me improve my speaking ability. The content is interesting. (Student #43)

I had a lot of fun doing the online drawing activities. (Student #59)

The lessons were very interesting. I hope to join again next semester. (Student #103)

In conclusion, first, synchronous English tutoing indeed enhanced tutees' English learning. Second, technology resources offered opportunities for autnentic interactions. Third, stories and e-books stirred learners' English learning motivation and then facilitated their literacy development.

## 5. Conclusion

This study investigated elementary students' English learning with SDGs lessons in a synchronous tutoring program. Tutees expressed they made improvements in English during a semester-long program. Thus, how to design lessons to engage students in learning English and to develop their awareness of SDGs seems important. Students made efforts and were engaged in this synchronous bilingual project. An earlier survey study shows that globally, awareness of the SDGs is approximately 50% (Theresa et al., 2020). In this study, the university tutors have been trained to design SDGs lessons. Young learners have been guided to be engaged in different SDGs lessons. With continuous learning, they can cope with the future world issues better.

This study has important implications in curriculum design with regard to incorporating SDGs into English lessons to facilitate young learners' language development. Students showed positive attitudes towards the lessons. They loved reading English stories. Furthermore, students' active participation in the bilingual tutoring lessons revealed a high level of interests and engagement. Their intrinsic motivation was then raised.

This study aims to inform valuable insights into future lesson planning and it hopes to contribute to the advantages of implementing SDGs lessons. The series of lessons had a significant influence on the students, who recognized the value and relevance of the SDGs lessons. This study suggests that with special attention on comprehensible input, structured task activities and controlled practice activities, the instructors can help young learners comprehend the ideas of SDGs lessons better.

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# Examining the influence of online English as a lingua franca interaction on L2 learners' speaking proficiency and intercultural communicative competence

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***Abstract***

*The present study investigated the effects of Computer Mediated Communication (CMC) in English as a lingua franca (ELF) conversation session on L2 learners' speaking proficiency and intercultural communicative competence (ICC). Thirty-six Japanese university students were divided into an Experimental Group (n = 20) and a Control Group (n = 16). The Experimental Group participated in online ELF conversation sessions for 10 weeks with interlocutors who lived outside of Japan. The Control Group took only their regular English courses and did not participate in the online ELF conversation sessions. The participants' English-speaking ability was measured at the beginning and end of the semester through the use of an AI-based online speaking test, and their ICC was assessed with a 30-item questionnaire that targeted four aspects of ICC. The results indicated that the overall CEFRJ speaking level of the Experimental Group statistically increased over the semester, while the overall speaking level of the Control Group did not. Similarly, in contrast to the Control Group, the Experimental Group showed statistically higher ICC at the end of the semester. Implications for ELF in L2 programs are discussed.*

***Keywords:*** *CMC; English as a lingua franca; L2 speaking; intercultural communicative competence*

## 1. Introduction

Online tutorial conversation platforms have become popular worldwide among second language (L2) learners. The major benefit of such platforms is that they enable L2 learners to communicate with native and fluent non-native speakers using simultaneous computer-mediated communication (SCMC). Indeed, in many of these situations, English is used as a lingua franca (ELF)—that is, L2 English speakers must use English to communicate with each other in learner-to-learner interaction and with native speakers or more competent L2 speakers. In a meta-analysis of the effects of SCMC-based videoconferencing on L2 skills, Yu (2022) found that it was effective for improving L2 speaking skills in English as a foreign language (EFL) environments. Iino (2022) also reported that the inclusion of videoconferencing in EFL instruction was beneficial for L2 fluency and complexity development.

In addition to these studies on videoconferencing and L2 oral skills, some studies have examined the effects of videoconferencing on other domains. Hetrovic (2021) reported that L2 Spanish learners in the US could gain emotional confidence and a sense of communicative capability through videoconferencing with both native

 

speakers and non-native speakers. Particularly, it was found that SCMC with native speakers was facilitative for creating "richness" in the language learning experience, where varied L2 input, abundant language forms, and feedback are available during interaction. Similarly, interactional opportunities in ELF could also help improve intercultural communicative competence (ICC; Byram, 2008). As Byram advocates, L2 linguistic competence is a crucial component to add to intercultural competence. Indeed, Freiermuth and Huang (2021) reported that their EFL telecollaboration project developed learners' intercultural competences, which were reflected in their discourse.

While much research in this area has focused on cognitive aspects of intercultural competence, language use and attitudes during interaction have received less attention. When online SCMC activities with peer interlocutors and with fluent non-native speakers using commercial online tutorial programs are integrated into L2 instruction, the effects of SCMC in an ELF environment on L2 speaking proficiency and ICC could be observable. To shed light on these aspects of online communication and instruction, the present study investigated the following research questions:

1. To what extent do L2 learners of English in Japan improve their speaking proficiency through participation in English as a lingua franca online conversation classes?
2. To what extent do L2 learners of English develop ICC through online conversation classes?

## 2. Method

### 2.1. Participants

Thirty-six university students majoring in economics at a large university in Japan participated in this study. There were 19 females and 17 males. Thirty-three of the participants reported Japanese as their first language, and three of them indicated Chinese, Korean, or Malaysian. Their ages ranged from 19 to 21, and they were in their second or third year of university. The participants were enrolled in two different sessions of a special seminar focused on English communication skills. The participants were divided into an Experimental Group ($n$ = 20) and a Control Group ($n$ = 16). The English proficiency of the Experimental Group was at the intermediate level as measured by the TOEIC ($M$ = 625.5, $SD$ = 98.7), as was that of the Control Group ($M$ = 512.8, $SD$ = 108.3).

### 2.2 Instruments

To measure speaking proficiency, an AI-based speaking test called PROGOS ® (PROGOS Inc.) was administered at the beginning and the end of a 14-week semester. The participants were assigned to take it outside of the class on their own. The test consists of five types of tasks: participating in an interview (Q&A), reading a passage aloud, giving a presentation with the topic and key concepts provided, giving a presentation based on a graph or table, and role play interaction. The test results are given as CEFRJ levels (i.e., Pre-A1 to B2 high and above). Each level was converted into a number which represented that level, resulting in scores that ranged from 1 to 9 (e.g., Pre-A1 = 1, A1 = 2, A1 High = 3). Additionally, the test provides scores for Range (i.e., vocabulary), Accuracy, Fluency, Interaction, Coherence, and Pronunciation. Each aspect of production was measured on a five-point scale.

ICC was measured using a 30-item questionnaire adapted from Miyamoto and Matsuoka (2000). Whereas the original focused more on intercultural understanding, the items that were revised or created for the current study focused more on participants' communicative behaviors, communicative skills, and attitudes toward understanding the cultural background of their interlocutors. A factor analysis of the ICC questionnaire data revealed a four-factor solution: *Awareness of interlocutor's comprehension and feelings* (14 items; Appendix), *Skills to state opinions and persuade interlocutors* (9 items), *Consideration of cultural background of interlocutors* (5 items), and *Assertive actions to state one's opinions* (2 items). Participants responded using a five-point scale with larger numbers indicating higher levels of a given construct.

 

### 2.3 Procedure

The Experimental Group participated in classroom debates and student-to-student online interaction outside of class. This group also participated in online conversation sessions offered by DMM Eikaiwa, which is a platform for one-on-one tutoring, outside of class with non-native speakers of English located in countries other than Japan (i.e., ELF). Out of 416 tutorial conversation sessions in which the participants participated, 66% of the conversation partners were Filipino, followed by Serbians (4.6%), Nigerians (3.6%), Zimbabwean (3.1%), and 45 other countries. The conversation sessions often took the form of an interview or a debate using the topic they discussed in weekly classes. The Control Group completed the same in-class tasks but had one-on-one online conversations outside of class with only their classmates—they did not participate in the ELF conversation sessions with tutors from outside of Japan. The instructional period was one class session per week for ten weeks of a 14-week semester. Both groups completed the AI-based speaking test and the ICC questionnaire at the beginning (T1) and end (T2) of the ten-week instructional period.

## 3. Results

### 3.1 Speaking proficiency

Descriptive statistics for the speaking test scores are shown in Table 1. Regarding the overall CEFRJ levels, no interaction effect was observed between the factors, $F(1,34) = 3.68$, $p = .074$, $\eta^2 = .01$. However, as shown in Table 1, the CEFRJ level for the Experimental Group statistically significantly increased from T1 ($M = 6.1$, $SD = 1.2$) to T2 ($M = 6.7$, $SD = 1.0$) and showed a medium effect size ($d = 0.61$), while the Control Group showed no significant increase and exhibited a weak effect size ($d = 0.12$). As for scores on the six categories of the speaking test, both groups showed statistically significant improvement for Range, Accuracy, Fluency, and Pronunciation. However, only the Experimental Group exhibited significantly higher scores on Interaction and Coherence.

**Table 1**. Descriptive statistics and statistical results for the PROGOS speaking test scores

| | | CEFRJ Level | | | Range | | | Accuracy | | | Fluency | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | | T1 | T2 | | T1 | T2 | | T1 | T2 | | T1 | T2 | |
| Exp. | *M* | 6.1 | 6.7 | ** | 4.1 | 4.4 | * | 3.6 | 4.0 | ** | 4.5 | 4.9 | ** |
| | *SD* | 1.2 | 1.0 | | 0.9 | 0.6 | | 0.8 | 0.7 | | 0.7 | 0.4 | |
| Cont. | *M* | 5.0 | 5.1 | | 3.0 | 3.4 | ** | 3.3 | 3.5 | * | 3.9 | 4.3 | ** |
| | *SD* | 1.1 | 0.7 | | 0.5 | 0.6 | | 0.7 | 0.5 | | 0.6 | 0.4 | |

**Table 1**. Continued

| | | Interaction | | | Coherence | | | Pronunciation | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Group | | T1 | T2 | | T1 | T2 | | T1 | T2 | |
| Exp. | *M* | 3.4 | 3.9 | ** | 4.0 | 4.4 | ** | 4.1 | 4.4 | ** |
| | *SD* | 0.7 | 0.7 | | 0.6 | 0.6 | | 0.4 | 0.5 | |
| Cont. | *M* | 2.9 | 2.9 | | 3.4 | 3.4 | | 3.9 | 4.1 | * |
| | *SD* | 0.6 | 0.4 | | 0.7 | 0.8 | | 0.4 | 0.3 | |

*Note*. Group A = Experimental; Group B = Control. *$p < .05$, **$p < .01$.

### 3.2 Intercultural communicative competence

The responses to the ICC questionnaire conducted at the beginning and the end of the semester are summarized in Table 2. The Experimental Group exhibited statistically significantly higher scores at the end of the semester on

 

Factor 1 ($p < .001$, $d = 0.66$), Factor 2 ($p < .001$, $d = 0.57$), and Factor 4 ($p = .02$, $d = 0.45$). The scores for the Control Group at the end of the semester were non-significant, and interaction effects were found only for Factor 1, $F(1,34) = 10.23$, $p = .003$, $\eta^2 = .09$, and Factor 2, $F(1,34) = 15.52$, $p < .001$, $\eta^2 = .09$.

**Table 2**. Descriptive statistics and statistical results for the ICC scales

| | | Factor 1: Awareness of interlocutor's comprehension and feelings | | | Factor 2: Skills to state opinions and persuade interlocutors | | | Factor 3: Consideration of cultural background of interlocutors | | Factor 4: Assertive actions to state one's opinion | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | | T1 | T2 | | T1 | T2 | | T1 | T2 | T1 | T2 | |
| Exp. | *M* | 3.8 | 4.1 | ** | 3.5 | 3.8 | ** | 3.7 | 3.7 | 2.1 | 2.5 | * |
| | *SD* | 0.5 | 0.4 | | 0.5 | 0.5 | | 0.5 | 0.6 | 0.9 | 1.0 | |
| Cont. | *M* | 3.9 | 3.6 | | 3.6 | 3.2 | | 3.7 | 3.5 | 2.3 | 2.5 | |
| | *SD* | 0.5 | 0.6 | | 0.5 | 0.7 | | 0.7 | 0.7 | 0.7 | 0.9 | |

*Note*. Group A = Experimental; Group B = Control. *$p < .05$, **$p < .01$.

## 4. Discussion

**RQ1: To what extent do L2 learners of English in Japan improve their speaking proficiency through participation in English as a lingua franca online conversation classes?**

The results for the first research question suggest that interacting with speakers of English as a lingua franca can lead to increases in L2 speaking proficiency. The Experimental Group exhibited significantly higher overall CEFRJ levels at the end of the semester, while the Control Group did not statistically increase their overall CEFRJ speaking levels. This result aligns with Yu's (2022) meta-analysis and the results reported in Iino (2022).

Since both groups had opportunities for student-to-student discussion on Zoom after regular classes on issues presented in class, the positive effects on speaking may have been brought about by online tutorial interaction. Among the benefits found through the research on paid online platforms,

As mentioned in the introduction, the uniqueness of this study is the type of conversation partners in SCMC. They were fluent, non-native English-speaking instructors. Considering the improvement in L2 speaking ability made during the semester, the participants in the Experimental Group could have benefited from the linguistic richness of ELF conversation in the commercial tutorials (Hetrovic, 2021). That is, the students may have received richer input, variation in forms, and corrective feedback during the conversations. It also might have played a crucial role engaging learners in the conversation in that the learners, not the tutor, managed the interview with their own questions. As Hetrovic suggests, the mixture of SCMC with peer and native (-like) speakers might have become a catalyst for boosting their speaking proficiency over the period of this study. The positive effects of videoconferencing were also emphasized by Yu (2022) in that SCMC activities enable L2 learners "to receive more authentic linguistic input and prompt feedback, and they have more language-use opportunities to interact with native speakers of their target language or more competent L2 users, such as peers or teachers" (p. 2).

**RQ2: To what extent do L2 learners of English develop ICC through online conversation classes?**

The increases shown by the Experimental Group on Factor 1 (*Awareness of interlocutor's comprehension and feelings*) may have come from their experience of talking online with people from varied cultural and linguistic backgrounds who were living in other countries. During the interviews, the learners might have realized how to avoid confrontation by paying attention to the interlocutors' responses and reactions, thus enabling their use of appropriate linguistic and social actions, which is included in Byram's (2008) ICC model. As shown in the interactions reported in Freiermuth and Huang (2021), the learners might have also developed clarification skills related to what they wanted to communicate to the non-Japanese speakers.

 

The Experimental Group also exhibited higher scores on Factor 2 (*Skills to state opinions and persuade interlocutors*), which may have occurred through active discussions during the ELF interview sessions on SCMC. The learners had to express their opinions while considering any disagreement or lack of understanding they might receive from the tutors. Those experiences might have contributed to increases in their ability to state their opinions strategically as well as logically. This finding might also be related to the outcomes for Factor 4, which indicated that the learners became more assertive in expressing their opinions. This result could be a by-product of a higher value placed on the importance of stating one's opinion in a persuasive manner.

## 5. Conclusions

The purpose of the present study was to examine the effects of online ELF conversation lessons on L2 learners' speaking proficiency and ICC. The Experimental Group, which participated in the ELF conversation sessions, showed significant gains in overall speaking ability. In contrast, the Control Group did not exhibit statistically higher speaking ability. Regarding ICC, the Experimental Group showed statistically significant development in their awareness of speakers' comprehension and feelings, their ability to state opinions and be persuasive, and their ability to clearly express their opinions. The Control Group, however, did not show such improvement. It was found that SCMC in an ELF environment can create rich opportunities to develop L2 speaking skills as well as ICC.

The current study is not without its limitations. Caution should be taken when generalizing the results in that the sample size of this study was small, and the proficiency levels of the groups were not controlled. In addition to these limitations, future research could examine qualitative aspects of ELF-based interaction such as learners' affective factors before, during, and after participating in those types of communicative activities.

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## Appendix

| | |
|---|---|
| Factor 1 | Q1 When I am listening to someone in English and there is a word or expression I don't understand, I ask the interlocutor to confirm the meaning.<br>Q2 I affirmatively smile and use a positive attitude and tone of voice to avoid making the person I am speaking to feel uncomfortable.<br>Q3 I respond in a way that helps the interlocutor relax while I am talking.<br>Q4 I use nods and sympathetic gestures to show understanding.<br>Q5 I try to empathize with what the interlocutor is saying.<br>Q7 Demonstrate understanding and cooperative attitudes with words as well as gestures and facial expressions.<br>Q8 I use words and expressions that are easy for the interlocutor to understand.<br>Q9 I add additional explanations for things the interlocutor seems not to know or to find difficult to understand.<br>Q12 To ensure that I am not the only one talking, and that each participant has an equal opportunity to speak.<br>Q15 I tell my story while expressing respect for the interlocutor's ideas and position.<br>Q22 I delay my own judgment and do not speak negatively about opinions that are unacceptable.<br>Q23 I express interest in and continue to listen to the interlocutor's opinions, regardless of whether or not they are acceptable to me.<br>Q26 I try to confirm that the interlocutor understands my opinion or what I am explaining.<br>Q28 When I have something to say while the interlocutor is speaking, I ask if I can say a few words so as not to interrupt the interlocutor's speech, and then speak my own words. |
| Factor 2 | Q16 I try to state my thoughts clearly on controversial topics.<br>Q17 I try to include evidence when expressing my opinions.<br>Q18 I include examples of my own experiences when expressing my opinions.<br>Q19 Depending on the topic, I tell others about my personality and thinking tendencies.<br>Q20 Depending on the topic, I disclose my strengths and weaknesses to others.<br>Q24 I state the importance of my opposing or conflicting opinion before expressing my own.<br>Q27 I Mention that other opinions are possible when expressing my own opinion.<br>Q29 I take control of the conversation by asking for taking turns before or after my own statement.<br>Q30 I propose a new topic of conversation and change to another topic. |
| Factor 3 | Q11 I take an attitude that shows as much interest as possible in the topic of the country/region of origin where the interlocutor lives.<br>Q13 I provide information on Japan when I find the topic is relevant to Japan.<br>Q14 I use language that takes into account the possibility that the interlocutor's identity.<br>Q21 I try to be careful whether the interlocutor is interested in Japanese culture.<br>Q25 I take into account the cultural background and lifestyle of the interlocutor. |
| Factor 4 | Q6 I state my opinion against the interlocutor's opinion, even if the interlocutor is in the middle of speaking.<br>Q10 If any association comes to mind while the interlocutors speaking, I interrupt the speech and state it. |

 

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# Self-access centers in EFL placement test preparation classes

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***Abstract***

*The purpose of this study is to determine the effects of a self-access center in students' exam preparation skills acquisition and students' test grades. It will examine students' test self-regulation strategies in a self-access center designed and implemented in Moodle to provide EFL (English as a Foreign Language) learners with a repository of organized and categorized resources ranging from A1 to B2 to maximize students' exam results. Students' strategies include planning, time management, goal setting and exam strategies monitored and surveyed during the class designed for native Spanish speakers learning English as a foreign language. Students are expected to use these strategies while they take a placement test preparation class in a four-month cycle. This type of class is a reinforcement course planned for students that have not reached a B2 English level in a placement test at the end of a four-level English Program in 480 hours and therefore, they need to improve language use, communication skills and exam strategies to finally reach B2. In this type of class, students complete 120 hours in face-to-face classes, and they are additionally required to complete 120 self-study hours distributed in activities in the course platform and in Moodle where they can access the Moodle placement test preparation course activities and the self-study access center resources. The study used qualitative and quantitative action research methodology. Data sources included students' learning logs and students' initial and final placement tests grades. Findings indicate students used the self-access center learning areas to access English learning resources, practice the language and develop exam preparation skills.*

***Keywords:*** *self-access center; EFL; placement test; self-regulation strategies; exam preparation skills.*

## 1. Introduction

This paper is aimed at identifying the effects of a self-access center in the acquisition of students' placement test preparation skills and students' placement test grades results in EFL classes. For this purpose, it examines students' self-regulation strategies when they use a virtual self-access center to do asynchronous learning activities and prepare for the test.

The self-study center was created, implemented and developed in Moodle in 2022 to enable EFL students to reinforce English learning and self-prepare for placement tests. The Moodle site is an organized, resourceful and intuitive self-study e-learning environment where students can use a menu to access the self-access center profile,

 

objectives, international exams information and learning resources categorized in four of the six English levels of the Common European Framework of Reference for Languages: A1, A2, B1, B2. It is available through students' course directories. Students can access resources organized in Moodle books in six learning areas of the self-access center: vocabulary, grammar, reading, listening, speaking and writing. Furthermore, they can find learning objectives, English learning topics, learning tips, English learning resources and exam practice web-based sites in every learning area to support and facilitate learning.

The center was designed in Moodle following the National Educational Technology Standards (NETS). According to Egbert (2005), "Upon leaving school, the NETS require that students will be able to use a computer and peripherals, practice responsible use of technology, use electronic resources appropriately, design, develop, and publish products, gather information and collaborate with others". (p. 14). Additionally, she points out that the NETS standards correlate with TESOL standards regarding standards and conditions for English learning. (p. 14).

Students used self-regulation learning strategies in the self-access center to self-prepare for a placement test aimed at students learning English as a foreign language. Oxford (1992, p. 18) states in general that "language learning strategies are specific actions, behaviors, steps and techniques that students (often intentionally) use to improve their progress in developing L2 skills. These strategies can facilitate the internalization, storage, retrieval, or use of the new language". This author looks at self-regulation more particularly in metacognitive language strategies and refers to them as "strategies that help learners exercise executive control through planning. arranging, focusing and evaluating their own learning" (ibid., p. 64).

Students' self-regulation strategies were examined in the study. Students used these strategies in the placement test virtual self-study center to manage test preparation practice activities registered in learning logs. According to the scientific basis of learning published in the volume of education research and theory *'How People Learn'*, self-regulation is present in metacognition, which is defined as "the ability to reflect on one's performance". To this respect, Bereiter and Scardamalia (1989, p. 97) refer to self-regulation in the volume "as the ability to orchestrate one's learning: to plan, monitor success, and correct errors when appropriate - all necessary for effective intentional learning".

Stern (2001, p. 411) highlights the importance of planning strategies in good learning when he refers to a good language learner. He states that: "In view of the sheer magnitude of the language learning task the good language learner will select goals and sub goals, recognize stages and developmental sequences, and actively participate in the learning process".

This paper examines how students used self-regulation strategies in a self-access center to discover their effects in EFL test preparation classes.

## 2. Method

### Context and participants

Ten students, aged 20 to 22, took a 120-hour English placement test preparation course in 13 weeks from January to April 2024. Their native language was Spanish. This course grouped mixed ability students with proficiency levels ranging from A2 to B1. They had not been able to reach a B2 proficiency level after completing four courses of 120 hours each.

Students took the course to prepare for the placement test and reach B2. This level is required in order to take content subjects in English in their university curricular plans. The placement test evaluates students' reading skills, listening comprehension skills and language use. Students take the test face-to-face in the computing lab.

Students enrolled in the preparation placement test course took 120 class hours. Additionally, they had to complete 120 asynchronous English practice hours in three Virtual Learning Environments (VLE); the course platform, the course VLE and the self-access center. They used a course platform provided externally and they accessed the course VLE and the self-access center in their institutional Moodle courses directories.

 

Students completed asynchronous hours in the course platform and in the Moodle course to practice the course content and objectives. They used the virtual self-access center as a placement test preparation learning environment to practice language use, develop communication skills and acquire exam skills. The self-access center enabled students to focus on their learning needs, do English activities in six learning areas and choose resources categorized from A2 to B2. Students were taking other major subjects of their curricular plan in addition to the placement preparation course dealing with academic requirements and time management demands.

## 3. Results

There were qualitative and quantitative data sources in the study. Qualitative data sources included students' learning logs results as shown in tables 1, 2 and 3. Quantitative data sources were students' placement test results presented in Table 3.

Overall students' learning logs results are presented in Table 1. They used them to register self-access center learning activities assigned weekly. Students' learning logs were examined to observe how they used self-regulation strategies when they used a virtual self-access center to keep a weekly record of exam preparation activities. Friesner and Hart (2005) state that learning logs "are ideal for encouraging learners to reflect on learning". In addition, these authors point out that "they are also a source of collective data" (p. 117).

Students completed learning logs in Moodle through a Google Drive folder where the following information was kept:

| Time | Learning area | Topic | Learning objective | What I learned | Follow up learning topics | Self-access center resources |
|---|---|---|---|---|---|---|

According to the students' learning logs results shown in Table 1, 10 out of 11 students used learning logs to organize, plan, choose, monitor and manage asynchronous test preparation learning activities and resources through the virtual self-access center during the course. Forty-nine hours in total were spent by 10 students in learning logs. Students' learning time varied from a minimum of one hour to a maximum of ten hours of asynchronous activities. Students managed and registered time in logs individually. Students registered the self-access center topics, objectives, activities and follow up practice topics in their logs. Seven students registered 10 topics, one student registered 16 topics and one student registered 9 topics respectively. One student did not complete the learning log.

Students used different exam preparation sites such as *Exam English* and *Test-English* to evaluate their results. They accessed the self-access center resources in levels ranging from A2 to B2 in different sites such as, *Exam English*, *British Council*, *English Radar* and *Test English* being the most commonly used.

**Table 1.** Students' self-access center learning logs results.

| Students' number | Learning time | Self-access learning areas and students' learning choices | Students' topics | Students' learning objectives | Learning logs activities | Follow up learning topics | Self-access center resources |
|---|---|---|---|---|---|---|---|
| 1 | 1 hour 10 min | grammar (2), listening (1) | 3 | 3 | 3 | 3 | 3 |
| 2 | 4 hours 5 min | grammar (4), reading (6) | 10 | 10 | 10 | 10 | 10 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

 

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 4 | 9 hours | grammar (5), reading (2), listening (3) | 10 | 10 | 10 | 10 | 10 |
| 5 | 5 hours 23 min | grammar (5), reading (1), listening (2), vocabulary (2) | 10 | 10 | 10 | 10 | 10 |
| 6 | 1 hour 30 min | listening (3), writing (1), grammar (4), vocabulary (1) | 9 | 9 | 9 | 9 | 9 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | 7 hours | Vocabulary (3), grammar (2), reading (1), listening (4) | 10 | 10 | 10 | 10 | 10 |
| 9 | 4 hours 41 min | grammar (7), reading (3) | 10 | 10 | 10 | 10 | 10 |
| 10 | 5 hours 45 min | grammar (7), reading (7), vocabulary (2) | 16 | 16 | 16 | 16 | 16 |
| 11 | 10 hours | grammar (3), reading (3), vocabulary (1), listening (3) | 10 | 10 | 10 | 10 | 10 |
| 11 sts | 49 | | 98 | 98 | 98 | 98 | 96 |

The number of students' choices in learning areas of the self-access center are reported in the second table. Ten students used five of the six self-access center learning areas: grammar, vocabulary, reading, listening and writing. Students' learning choices were higher in two of the self-study learning areas: grammar and reading as shown below.

**Table 2.** Students' self-access center in terms of language skills and areas.

| Students' number | Grammar | Listening | Reading | Writing | Vocabulary |
|---|---|---|---|---|---|
| 1 | 2 | 1 | 0 | 0 | 0 |
| 2 | 4 | 0 | 6 | 0 | 0 |
| 3 | 0 | 0 | 0 | 0 | 0 |
| 4 | 5 | 3 | 2 | 0 | 0 |
| 5 | 5 | 2 | 1 | 0 | 2 |

 

| | | | | | |
|---|---|---|---|---|---|
| 6 | 4 | 3 | 1 | 1 | 1 |
| 7 | 10 | 0 | 0 | 0 | 0 |
| 8 | 2 | 4 | 1 | 0 | 3 |
| 9 | 7 | 0 | 3 | 0 | 0 |
| 10 | 7 | 0 | 7 | 0 | 2 |
| 11 | 3 | 3 | 3 | 0 | 1 |
| | 49 | 16 | 24 | 1 | 9 |

Students' placement test results are presented in Table 3 to compare students' placement tests results before and after they took the placement test preparation course.

Placement tests were used to evaluate students' English proficiency levels in three areas: reading, listening and language use. They took placement tests in the course platform in the computing lab. Tests were administered to evaluate their proficiency levels. The initial and final placement tests grades were compared to report on students' placement results at the end of the placement test preparation course.

Students' placement test grades were saved and kept in the course platform after the tests administration. Students' grades were accessed through the course test reports platform option. According to the students' platform placement results, seven out of eleven students were placed in higher levels ranging from B1 to B2. Five out of these seven students reached a B1 level. One student was placed in B1+ and one student was placed in B2. Students took the placement test in the course platform on dates indicated in table 3; the test was taken twice, before and after the placement test preparation course.

According to students' placement test results processed in the course platform, one student was placed in the same B1 level. One student was placed in A2 level and one student was placed in a lower level than the initial. This student's placement was lowered from B2 to A2.

**Table 3.** Example of a student' learning log vocabulary topic.

Reinforcement Class: Self-Study Lesson

| **Week-Date Time Spent** | **Learning Area** | **Topic** | **Learning Objective** | **What I learned** | **What I still need to practice** | **Resources Add the link of the page you practiced and the score capture** |
|---|---|---|---|---|---|---|
| 1.<br>February 13th, 2024<br>1 hour | Vocabulary | Holidays | Put the words in order to make sentences and choose the best word to complete sentences to learn words. | I learned the basic and intermediate 2 vocabulary of holidays. | I need to practice a little more about different places to go on holidays. | https://learnenglish.britishcouncil.org/vocabulary/a1-a2-vocabulary/holidays<br>Total score is 12 out of 12 (100%)<br>https://www.examenglish.com/B2/b2_vocabulary_holidays.htm<br>Reset Score:9/10 |

 

**Table 4.** Students' initial and placement tests results.

| | Test dates | Placement | Test dates | Placement | Levels |
|---|---|---|---|---|---|
| 1 | 1/8/2024 | Basic 3 | 4/4/2024 | Intermediate 1 | B1 |
| 2 | 22/11/2023 | Intermediate1 | 4/4/2024 | Intermediate 1 | B1 |
| 3 | 22/11/2023 | Basic 2 | 4/10/2024 | Basic 2 | A2 |
| 4 | 22/11/2023 | Basic 3 | 21/06/2024 | Intermediate 1 | B1 |
| 5 | 24/3/2022 | Basic 2 | 4/4/2024 | Intermediate 1 | B1 |
| 6 | 18/2/2021 | Basic 2 | 4/4/2024 | Intermediate 1 | B1 |
| 7 | 30/11/2023 | Basic 2 | 4/4/2024 | Intermediate 2 | B1+ |
| 8 | 19/7/2023 | Intermediate 2 | 4/4/2024 | Intermediate 1 | B1 |
| 9 | 22/11/2023 | Basic 3 | 4/4/2024 | Intermediate 2 | B1+ |
| 10 | 24/11/2023 | Advanced 1 | 4/4/2024 | Basic 3 | A2 |
| 11 | 21/11/2023 | Basic 3 | 4/4/2024 | Intermediate 3 | B2 |

## 4. Discussion

Results indicate the effects of a self-access center in asynchronous English learning activities in an EFL placement test preparation class in terms of students' learning activities management, language practice and resources chronological organization. According to students' learning logs records, the self-access center was used once a week for 13 weeks as a virtual learning environment for students' time management, self - study and self - evaluation purposes.

Students' learning logs results show students focused on their learning needs and kept records of the self-access center test preparation learning activities and learning resources. Logs indicate students planned and organized self-study time, learning objectives and learning resources, making their own learning choices and focusing language practice on grammar, vocabulary, reading, listening and writing as shown in the example of one student's learning log vocabulary topic in table 3.

Students' learning choices were higher in grammar and reading than in other learning areas of the self-access center as shown in the results. Students accessed different English learning web sites to complete asynchronous vocabulary, grammar, reading, writing and listening activities and prepare for the test. In addition, they self-evaluated their English knowledge and skills using resources provided in web sites designed for self-evaluation purposes. English learning websites were registered in their learning logs, including captures of activity's scores. Speaking was not included in students' learning logs.

70% of the students reached higher levels in the final placement test at the end of the class. Placement tests results are indicators of students' progress in the placement test preparation class where students used three virtual learning environments: an external English learning platform, the Moodle virtual learning environment and the self-access center to maximize time management, language practice and skills development.

## 5. Conclusions

This paper looked at the effects of a self-study center in students' exam preparation skills acquisition and students' placement test results. According to overall findings, students used the self-study center to reinforce learning, prepare for the test and acquire exam preparation skills as registered in their learning logs. Findings show students acquired exam preparation skills such as, following instructions, controlling time, planning, self-evaluating and monitoring progress when they practiced and self-prepared for the test through self-access resources planned, selected and managed by students.

 

Students' final placement test results indicate that 70% of the students were placed in higher proficiency levels while 30% of the students were placed in the same initial level according to the platform reports. Students used an external platform and a Moodle class as two more virtual learning environments to prepare for the test in addition to the self-study center. Therefore, this study does not measure the quantitative effects of the self-study center in students' achievement levels progression. A further study seems to be an option to focus on and measure its quantitative effects in students' achievement levels development.

The study implies beneficial effects of incorporating a self-access center institutionally for students' exam preparation training purposes, as they can maximize students' test preparation time management and exam skills. It would be recommendable to start with induction sessions and/or tutorial videos to inform about its purpose and functionality as shown in this introductory video.

There are additional implications in the study regarding time management. Concerning this point, students can use self-study centers to increase and maximize exam preparation time, provided they dedicate enough time to self-exam preparation practice. They can use them to focus on their learning needs, make their own learning choices, use learning strategies and develop exam skills.

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# The impact of social presence in synchronous online language learning in non-formal adult education for interaction competence

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***Abstract***

*The increasing popularity of online learning platforms has provided a convenient and accessible option for adults seeking to enhance their language skills. However, replicating the social aspects of a traditional classroom environment can be challenging in a virtual setting. This study investigates the impact of social presence on the development of spoken language skills in adult learners. The research involved 35 adult learners in a non-formal English course delivered synchronously via Zoom. Learners were surveyed on their perception of social presence, instructor presence, and their progress in developing spoken English proficiency. The findings revealed a strong correlation between social presence and a positive learning experience for adult learners. Humour emerged as a key element fostering interaction and collaboration among learners. The ability to connect with fellow students further contributed to a sense of community. Notably, a robust instructor presence was identified as critical in establishing and maintaining a high degree of social presence. More importantly, learners reported significant improvement in their spoken language skills. A supportive and positive learning environment, coupled with well-designed online activities that encouraged collaboration, were highlighted as key factors contributing to this improvement.*

***Keywords:*** *social presence; online learning; non-formal learning; spoken language skills.*

## 1. Introduction

The pervasiveness of online learning platforms has transformed language education, offering adults greater flexibility and accessibility in their pursuit of language acquisition. However, the inherent challenge of replicating the social aspects of a traditional classroom environment in a virtual setting persists (Bergdahl, 2022). Social interaction, a cornerstone of language learning, plays a crucial role in promoting learner engagement, facilitating collaborative learning opportunities, and fostering a sense of belonging (Rourke et al., 2001). This study investigates the impact of social presence, the feeling of connection within an online space (Short et al., 1976), on the development of spoken language skills in adult learners enrolled in a non-formal online English course.

The concept of social presence has been extensively explored within the context of online learning environments. Garrison et al. (2000) Community of Inquiry (CoI) framework identifies social presence as one of the three core elements, alongside cognitive presence and teaching presence, that are critical for fostering a successful online

learning experience. Social presence is further characterised by the degree of intimacy and immediacy experienced by learners in the virtual space (Wiener & Mehrabian, 1968). Studies have shown that a high degree of social presence fosters a sense of community and belonging among online learners (Tu & McIsaac, 2002; Dunlap et al., 2016; Krejns et al., 2022), leading to increased interaction and communication (Lowenthal & Dunlap, 2020; Panjefouladgaran et al., 2024), ultimately contributing to improved learning outcomes (Whiteside et al., 2017).

This research specifically focuses on the impact of social presence on adult learners developing spoken language skills. Adult learners often mention the development of spoken language as a primary reason for pursuing language courses (MacIntyre et al., 1997). However, speaking a new language can be a daunting experience, particularly in an online environment where opportunities for spontaneous interaction may be limited. A high degree of social presence can create a safe and supportive learning environment where adult learners feel comfortable taking risks and practising their spoken English skills (MacIntyre et al., 1997). We must consider that the new approach to teaching post COVID-19 should not simply replicate an onsite classroom in an oline setting, rather, it should transform synchronous teaching into an experience that enhances the learner's sense of social presence (Kimmons et al., 2020).

## 2. Method

### 2.1. Context and course design

The context of this research is an adult education centre in Finland where the learners attend the courses in their free time as a hobby. In pre-pandemic time the courses at the adult learning centres were predominantly implemented via face-to-face learning approach. During the pandemic, the course offering was forced to be transferred online. After the pandemic, some course offerings remained available in online versions, such as the course of our research.

The course design adhered to the CoI framework, emphasising the importance of social presence. The course spanned two semesters, with each weekly session lasting 1.5 hours. The sessions typically commenced with an icebreaker activity designed to encourage interaction and familiarise participants with each other. Following the icebreaker, a warm-up activity introduced the day's topic, which was related to grammar or the textbook content. Tasks were first teacher-led and then practised in pairs within breakout rooms. Each online session concluded with a wrap-up activity where all learners returned to the main Zoom room. During this activity, learners reflected on what they had learned and what takeaways they gained from the session.

### 2.2. Participants

The research involved 35 adult learners enrolled in a non-formal English course delivered synchronously online through Zoom. The participants' ages ranged from 20 to 80 years old, with the majority (59%) falling within the 51-70 age bracket. Their educational backgrounds varied from compulsory primary and lower secondary education (17%) to higher education (45%). All participants possessed a basic understanding of English, ranging from A1 to B1 on the Common European Framework of Reference for Languages (CEFR) scale.

### 2.3. Data collection and analysis

To investigate how students perceived social presence, instructor presence, and the development of their spoken language skills, a questionnaire was created using Webropol software. The questionnaire of 29 questions was based on the design of the social presence scale originally introduced by Tu and McIsaac (2002). The questionnaire was divided into two sections with a total of 29 multiple-choice questions: teaching presence (13 questions) and social presence (9 questions). Seven additional multiple-choice questions were added to the social presence section to gain a more comprehensive understanding of the aspects which learners perceive having an impact of social precense. All multiple-choice questions used a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). To triangulate the data and gain a deeper understanding of student perceptions, six open-ended questions

were included about the student's learning experiences. The questionnaire was administered anonymously, and respondents answered in Finnish.

Three weeks before the courses' completion, the survey link was added to the learning management platform and shared during the last three online sessions in the Zoom chat window. A total of 42 students participated in the four online English courses; however, only 35 responded to the questionnaire, resulting in an 83.33% response rate.

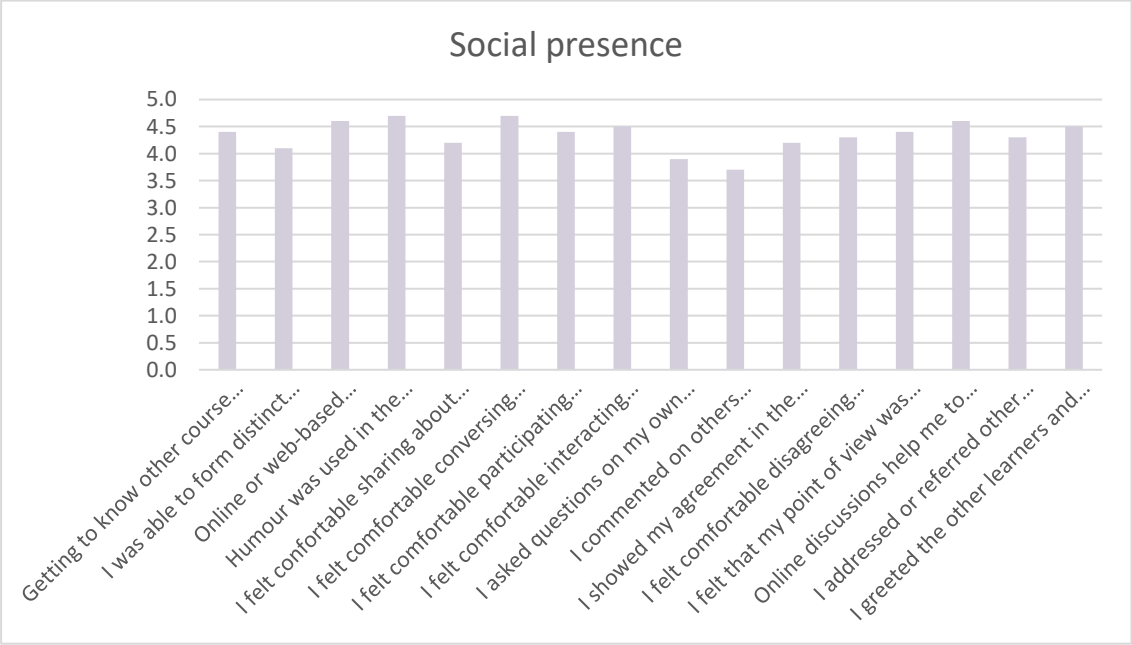
Quantitative data from the multiple-choice questions were analysed using basic statistical methods. Qualitative data from the open-ended questions were analysed using the deductive content analysis method (Krippendorff, 2019). In the initial analysis stage, the data were reviewed thoroughly several times. Expressions related to the social presence aspects according to the CoI theory of affective, interaction, and cohesive elements were then identified, categorised, and divided into indicators.

The qualitative data were further analysed using a data-driven content analysis method focusing on spoken language skills. A total of 117 expressions were identified and divided into five categories: collaboration, course atmosphere, course design, learner activity, and teacher impact.

## 3. Results

The results indicated a high perceived level of social presence (SP) among the learners in the class, as depected in Table 1. Humour emerged as the most significant aspect within the affective category of the SP scale. Self-disclosure, a key element in building social presence, presented some challenges. While students expressed a sense of belonging to the course they felt less comfortable sharing personal details about their lives which impacted their ability to form clear impressions of other participants.

**Table 1.** Social presence.




Despite the challenges with self-disclosure, the emphasis on interaction in this course was perceived positively. Students reported feeling comfortable participating in discussions. Confidence in using the video conferencing platform for online discussions was also rated highly. While commenting on others' contributions, asking questions and indicating agreement were used less frequently. Features that encourage interaction were seen as helpful in building cohesion. There were ample opportunities for online discussions, and learners found these discussions

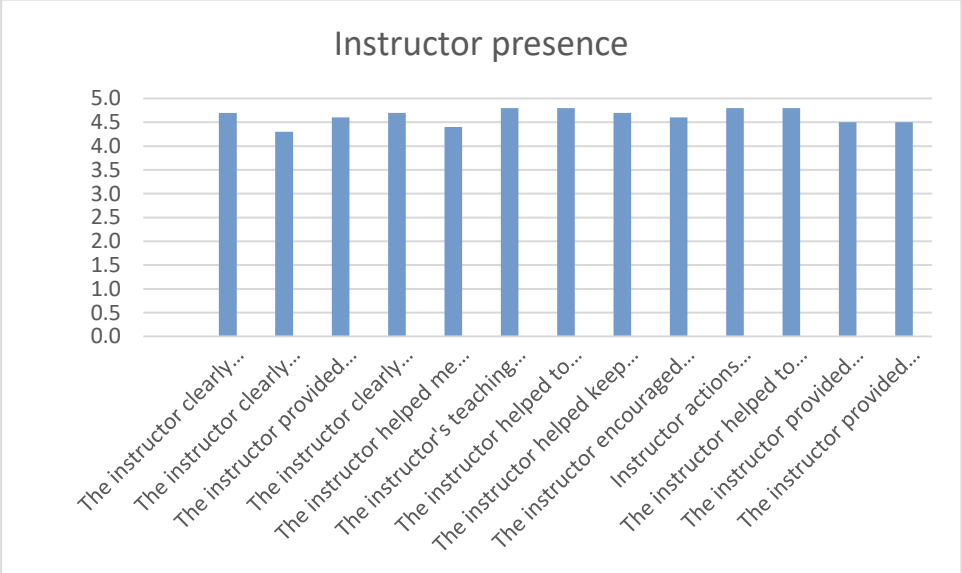
valuable in developing a sense of collaboration. They greeted and said goodbye to other learners and felt their viewpoints were valued. There was a sense of comfort disagreeing with others while maintaining trust and learners used each other's names.

Humour (4.7) was regarded as the most significant aspect in the affective category in the SP scale. Humour is a valuable component in promoting social presence during online sessions. A student stated: "I really enjoyed the humour and the joyful atmosphere in the course. I felt relaxed because of the shared humour.

Participants identified several factors contributing to their sense of realness in the classroom. The sense of group cohesion fostered self-confidence and enjoyment. Examples of building a cohesive environment were seen in student responses where they referred to themselves as "us" in the class or addressed their fellow learners by name. The prescribed etiquette from the instructor, such as thanking students for comments and complimenting each other, helped create a safe and respectful classroom atmosphere.

The learners' perception of instructor presence revealed the teacher's significant role (see Table 2) . Clear explanations were essential for supporting learning. The instructor effectively managed the flow of conversation, keeping the primary focus on spoken language development. Direct instruction and the instructor's feedback were appreciated for enhancing motivation and learning.

**Table 2.** Instructure presence.




Ninety-five percent of participants reported improvement in their spoken language skills during the course. Overall, collaboration, course atmosphere, course design, learner effort, and teacher impact were perceived as the key contributors to spoken language development. (see Image 1)

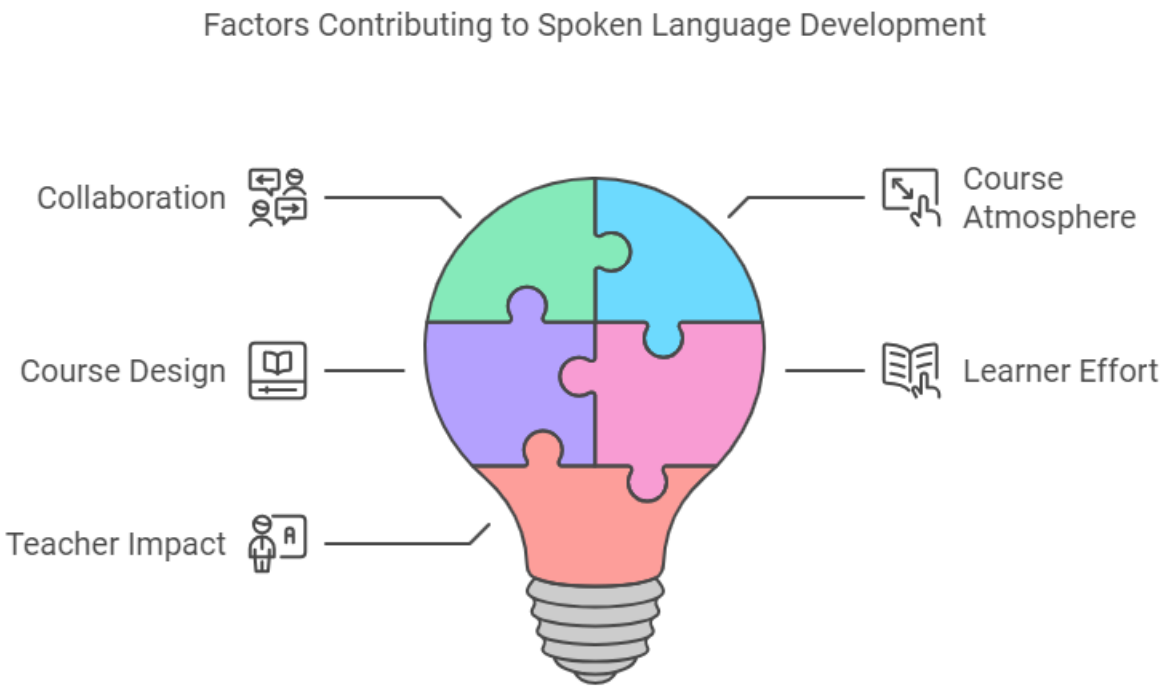



Figure 1. Elements contributing to spoken language development

## 4. Discussion and conclusions

This study focused on the development of spoken language skills in an online English course for adult learners, with a particular emphasis on the role of social presence. The findings demonstrate that social presence-based tasks can significantly enhance the online learning experience for adult learners.

Humor emerged as a crucial element in fostering interaction and collaboration among learners. This aligns with Tu and McIsaac's (2002) study, which highlighted the importance of using both formal and informal communication styles in online courses depending on the situation. As our results indicate, the formality level decreased over the course duration, fostering a relaxed and informal online community. This finding is further supported by Panjefouladgaran et al. (2024), who emphasise the importance of digital technology in facilitating online student interaction. In our study, students felt comfortable using the online platform enabling them to interact without hesitation and develop a unique learning community. This aligns with Tu and McIsaac (2002), who suggest that once a learning community is established, the learning process can be divided into three domains: social context, online community, and interactivity. Krejns et al. (2022) redefine social presence in their article and propose two additional components to consider in the online learning place: social space and sociability. Social space is contributed to by a sense of community, group atmosphere, mutual trust, social identity, and group cohesion. Sociability can be, i.e., small talk or, in our study, humour, which has a function in developing trustworthiness, group cohesion, and social space.

The sense of "realness" in the online classroom environment relates to the findings of Guanwardera (1995). This study suggests that the feeling of realness is not solely dependent on the media used to facilitate interaction among participants, but is also closely linked to the tasks themselves. Tasks are part of course design and require instructor involvement; therefore, the instructor plays a vital role in developing social presence as both a designer and guide. The role of the instructor deserves further exploration within the framework of social presence. Lowenthal and Dunlap (2020) call for more research on how teachers develop social presence, while Garrison and Arbaugh (2007) highlight the importance of instructors who can facilitate and guide higher-order learning, create an open communication climate, and build group cohesion. Our findings demonstrate a strong link between social presence and instructor presence, suggesting that a high degree of social presence in an online classroom can only be

achieved with a strong instructor presence. These two presences are inseparable and must be considered together in teaching online spaces.

Finally, we examined the elements that learners perceived as enhancing their spoken language development. A positive and joyful course atmosphere was viewed as the most effective way to promote spoken interaction. A secure learning environment encourages learners to speak the target language, and an atmosphere where learners feel valued and supported motivates them to contribute and participate actively. These findings are supported by Wriggelsworth (2019) and Leino (2017).

In conclusion, social presence-based tasks made the online language course more engaging and interactive, significantly impacting learner motivation. These tasks fostered a sense of community, provided a supportive and respectful learning environment, and facilitated improvements in language skills, particularly spoken language skills. The learners perceived social presence and interaction in the online course as beneficial and felt that their listening and speaking skills in the target language had improved, which was the primary goal of participating in the course.

The results of this study contribute to the growing body of research on social presence and spoken language development in online learning environments. Furthermore, it provides valuable, research-based information for online non-formal adult education. Adult learners participating in language courses at adult education centers often prioritise improving their spoken language skills.

A limitation of this study is the relatively small sample of 35 participants, which is a relatively small sample size.

This could limit the generalisability of the findings to other adult learners' contexts. It's possible that the results are specific to the participants in this study, and might not hold true for other learners with different backgrounds or learning styles. However, the participants of this study represent a typyical set of learners in an adult education center's language course and the number of learners on a course is typical. Therefore, we consider this limitation to be minor as the research context reflects the real-life situation in the setting we investigated.

Future research could explore how to create a sense of social presence in online language courses with larger and more diverse groups of learners. That could help to confirm or refute these findings and enhance generalisability. Further research could also explore the impact of social presence on spoken language development in different online learning contexts, platforms and approaches such as asynchronous, blended learning and hybrid implementation modes. Additionally, it would be beneficial to investigate the long-term effects of social presence on spoken language development and retention in online language learning environments.

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# Teacher training in CALL

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# From zero to hero: A longitudinal study of ICT attitudes in relation to language teaching in the technology era

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***Abstract***

*In this longitudinal study, how EFL instructors understand the use of computer technologies and their attitudes towards ICT (Information and Communication Technologies) are investigated. The aims are to define the instructors' attitudes, explain the relationship between instructors' attitudes and their ICT use, and specify the ICT needs of their language teaching using two types of data collection instruments. In the initial study conducted in 2017, the first questionnaire measured ICT use with the participants' demographic features and the second aimed to identify instructors' attitudes towards ICT. Additionally, some instructors were interviewed to get a more in-depth understanding of their attitudes and ICT use. After 7 years, the same research setting is used with the same data collection instruments to analyze the effects of technological developments of the era regarding instructors' ICT use in language teaching and moreover, the frequency of use and familiarity with AI tools have also been analyzed in the second phase of the study. The findings reveal that nearly all participants regard ICT as an invaluable tool for their teaching and have moderately positive attitudes towards using it for professional reasons compared to the previous study results. Variables such as age, teaching experience, and computer skills play no more significant role than past data. However, instructors' primary ICT need is still training. After the COVID-19 period, they feel more secure with their technology use due to the forced online and henceforth, hybrid teaching practices and teacher training courses supported by their institution. The results of this study have pedagogical implications for teacher education, English teachers and language schools.*

***Keywords:*** *teacher training in CALL; ICT and language teaching; teachers' attitudes towards CALL; longitudinal.*

## 1. Introduction

Integrating Information and Communication Technologies (ICT) and Artificial Intelligence (AI) in language teaching has become crucial in modern education. The departure point of these technologies is early Computer-Assisted Language Learning (CALL) methodologies. The umbrella term CALL was initially divided into three phases. According to Warschauer (2000), behavioristic CALL's initial phase was founded on behaviorist theory, which was used in education in the 1960s and 1970s and included repetitive language drills. With the help of this drill and practice software, the learner is provided access to the computer, acting as a tutor and receiving instructional materials (Taylor, 1980). Within this paradigm, PLATO (Programmed Logic for Automatic

 

Teaching) was one of the most likely CALL tutoring systems; it consists of translation-related assessments, grammar rule explanations, and drills (Ahmad et al., 1985). Then, as personal computers became more popular, additional communication software became available, opening up new possibilities for individual users. The communicative CALL, which was the second phase and implemented in the 1980s-1990s, was affected by these changes and focused on communicative approach. Finally, this phase paved the way for the third one, which is called integrative CALL thanks to multimedia computers and the internet. Following the advent of the internet, nowadays, we can experience today's technology, such as ICT and AI in language teaching.

ICT in language education offers significant advantages regarding access to up-to-date resources and individualized instruction. However, the integration of ICT, at the same time, presents challenges such as digital risks, content-sensitive issues, ethical use, and adequate teacher training (Popov & Popova, 2020). Therefore, the success of technology interaction in terms of ICT and AI tools heavily depends on educators' attitudes and their skills to effectively use these tools because the modern classroom settings have been transformed, moving away from traditional methods to integrative and engaging environments supported by ICT (Alkamel & Chouthaiwale, 2018). With the introduction of AI more recently, language education tools and environments have further revolutionized. For example, in educational contexts, AI applications include intelligent tutoring systems, personalized learning platforms, automated grading systems, and language learning tools. Recent studies have strongly suggested that language learners have positive attitudes towards AI tools for language learning, which plays a significant role in maximizing second and foreign language acquisition (Chen et al., 2023; Wang et al., 2022) whereas educators' attitudes towards the use of ICT are still under-researched area although attitudes, ICT experience and ICT competence appear to play a determining role in the technology integration (Pozas & Letzel, 2023). In addition to these factors, educators' familiarity with AI tools is important since the continuous evolution of ICT and AI in language education underscores the importance of preparing educators to integrate these technologies into their teaching practices effectively and to navigate their teaching in the age of AI. With these aims in mind, the current study aims to report on a longitudinal study that examined the relationship between instructors' attitudes and their ICT use and specified their ICT needs for their language teaching.

## 2. Method

### 2.1. Context and participants

The purpose of this cross-sectional study is to assess the seven years frame whether there are any attitudinal changes towards the use of ICT in the teaching process after the lecturers experienced the COVID-19 pandemic. The pandemic means online teaching for the full 2020-2021 academic year and following that period, the higher education institution in the current study decided to follow an adaptation of a hybrid model of teaching that means three-day face-to-face and two-day online teaching per week. That is to say, during the last quadrennial period, the traditional academic year at universities has given its place to compulsory online teaching due to the pandemic. Since then, hybrid teaching models have become popular for university language teaching programs. The current study was conducted at a language center, which belongs to one of the state universities in Turkey, and adopts the longitudinal experimental design to follow instructors' ICT attitude change over time and additionally, for the second phase, the frequency of use and familiarity with AI tools have been analyzed. To this end, the following research questions were addressed:

1. Have lecturer attitudes towards ICT changed in seven years, including the pandemic and the transition to hybrid teaching programs? If so, how?

2. Do relationships exist among the variables such as age, teaching experience and computer skills?

3. What has played the most significant role in developing EFL instructors' technology skills over the seven years?

In terms of institutional choice, the researcher's workplace was chosen as a research setting, a School of Foreign Languages at a public university in Turkey. This higher education institution offers compulsory and optional extensive English classes for students before they start studying their majors. This English language education

 

lasts for two semesters, approximately nine months. All classrooms have computers with internet access, a sound system and projectors. The i-tool versions of course materials, including e-book versions and audio files, are available for teaching on all classroom computers. In total, 30 instructors teaching English as a foreign language (EFL) participated in the study. Of all participants, 25 were female, and 5 were male. 2 instructors are between 20–29 years old, and 2 other instructors are 30–39. The rest of the 26 participants are in the age category of 40–50 years old. This can be reflected in teaching experience: except 3 participants, all instructors (n=27) seem to have more than 11 years of teaching experience. In the earlier work with the same research setting, the initial group involved 63 participants (see Öztürk, 2017). Due to the pandemic deaths, early retirement factors, and institutional changes, the number of instructors working has shrunk in recent years. Thus, for the second data collection period, the number of participants is comparably lower over 7 years. In comparison to the first phase of the study, almost half of the participants out of 30 instructors are the same people in the second phase.

### 2.2. Data collection instruments

There is a five-point scale questionnaire administered in Öztürk (2017). The same questionnaire was replicated with the same number of items but with a slight modification of adding a new subsection related to familiarity with AI tools such as ChatGPT, Bing AI, OpenAI playground, Bard AI, DialoGPT, Google Translate, Grammarly, Duolingo, and DeepL. Participants were asked to consent and complete the parts related to the demographic values. They were expected to rate questionnaire items measuring the level of attitudes towards ICT, ICT use and needs on a five-point Likert scale with one open-ended question at the end of the survey, which asks about specifying the most important thing related to their development of technology skills during their last 7 years of teaching. The questionnaire was conducted in English, and the familiarity with AI tools section was newly employed in the present study to provide a more detailed analysis of current familiarity with AI tools. The study was administered from January to June 2024 using Google Forms.

### 2.3. Data analysis

The Shapiro-Wilk test was used to assess whether the variables follow a normal distribution. Variables were reported as mean±standard deviation values, and the results of normality tests showed that the data was normally distributed. According to the data normality, parametric tests such as an independent t-test were used for the group comparison of mean scores and for the variables such as age, teaching experience and computer skills, one-way ANOVA was used. Regarding qualitative data, answers were color-coded, and thematic analysis was performed.

## 3. Results

### 3.1. Quantitative data results

The collected data results are presented in this section, starting with the quantitative data results. To find out instructors' attitudes towards using ICT, the Cronbach Alpha for the attitude questionnaire was 0.92. For the comparison of mean scores of instructors between 2017 and 2024, an independent t-test was used, and the statistical findings are shown in Table 1. The results revealed significant differences in mean scores between 2017 and 2024 regarding seven attitude statements out of 38 attitude items in the questionnaire. A closer inspection of the table shows that the first attitude sentence, which highlights that ICT use is beneficial regarding reaching goals of academic programs, yielded significant results (M=4.74 in 2017 and M=4.43 in 2024; two-tails: $t$ (91) = -2.145, $p$ =.035[a]). It was found that the attitudes regarding reaching the goals of academic programs were more positive in the past. The data revealed that instructors have mildly less positive attitudes regarding ICT use to get the aimed results in their teaching. The next attitude item with significant results is the seventh statement (M=2.58 in 2017 and M=1.83 in 2024; two-tails: $t$ (91) = -4.137, $p$<.001) that 'I find it difficult to use ICT in the class'. Since this is a reverse-coded item, the results suggested that the participants felt more experienced with ICT after seven years and developed positive attitudes towards using it in class. Moreover, there are a few other reverse items with significant differences in mean scores between 2017 and 2024 in terms of finding ICT use in the class time-consuming (M=2.14 in 2017 and M=1.70 in 2024; two-tails: $t$ (91)= -2.244, $p$<.0.027), finding ICT use not suitable

 

for the country (M=2.15 in 2017 and M=1.53 in 2024; two-tails: *t* (91)= -3.365, *p*=.001), no need to know about ICT application field (M=2.09 in 2017 and M=1.60 in 2024; two-tails: *t* (91)= -2.649, *p*=.01) and thinking that ICT limits teachers' creativity (M=2.34 in 2017 and M=1.83 in 2024; two-tails: *t* (91)= -2.721, *p*=.008). It can be observed that the overall attitude of the respondents regarding these questionnaire items appears more positive than that of the former research. Turning back to the results with the non-reversed attitude statements, the last significant questionnaire item is number 30, which stated that ICT is a source of confidence and courage for teachers (M=3.52 in 2017 and M=4.13 in 2024; two-tails: *t* (91) = 2.254, *p*=.027). Statistically analyzed data suggest a moderate increase in attitudes towards ICT centering around the instructors' creativity, courage and confidence, classroom use, the necessity of the knowledge in ICT applications and the suitability of ICT for the country.

**Table 1**. Descriptive statistics for the attitude questionnaire.

| | Subjects | n | Mean | *SD* | *df* | *t* | *p* |
|---|---|---|---|---|---|---|---|
| 1.I find ICT use useful regarding reaching goals of academic programs. | 1** | 30 | 4.433 | 0.971 | 91 | -2.145 | .035[a] |
| | 2*** | 63 | 4.746 | 0.439 | | | |
| 2. ICT use in the class causes extra work.* | 1 | 30 | 2.367 | 1.159 | 91 | -1.845 | .068 |
| | 2 | 63 | 2.857 | 1.216 | | | |
| 3. I think that ICT use in the class increases teacher's success. | 1 | 30 | 4.233 | 0.817 | 91 | -0.405 | .687 |
| | 2 | 63 | 4.302 | 0.733 | | | |
| 4. I believe that lessons with ICT draw students' attention. | 1 | 30 | 4.233 | 1.073 | 91 | -1.423 | .158 |
| | 2 | 63 | 4.524 | 0.840 | | | |
| 5. I think ICT instruments are expensive.* | 1 | 30 | 3.633 | 1.066 | 91 | 0.472 | .638 |
| | 2 | 63 | 3.508 | 1.256 | | | |
| 6. ICT use in education is luxury for our country.* | 1 | 30 | 2.067 | 1.172 | 91 | -1.783 | .078 |
| | 2 | 63 | 2.476 | 0.965 | | | |
| 7. I find it difficult to use ICT in the class.* | 1 | 30 | 1.833 | 0.747 | 91 | -4.137 | < .001 |
| | 2 | 63 | 2.587 | 0.854 | | | |
| 8. I find it time consuming to use ICT instruments in the class.* | 1 | 30 | 1.700 | 1.022 | 91 | -2.244 | .027 |
| | 2 | 63 | 2.143 | 0.820 | | | |
| 9. I believe that ICT support makes learning easier. | 1 | 30 | 4.400 | 0.814 | 91 | 0.209 | .835 |
| | 2 | 63 | 4.365 | 0.725 | | | |
| 10. I want to use audio-visual materials in my classes. | 1 | 30 | 4.767 | 0.504 | 91 | 0.646 | .520 |
| | 2 | 63 | 4.698 | 0.463 | | | |
| 11. I think ICT use in the lesson increases students' success. | 1 | 30 | 4.567 | 0.679 | 91 | 0.788 | .433 |
| | 2 | 63 | 4.429 | 0.837 | | | |

 

**Table 1**. Descriptive statistics for the attitude questionnaire.

| | Subjects | n | Mean | *SD* | *df* | *t* | *p* |
|---|---|---|---|---|---|---|---|
| 12. I think that thanks to ICT use, students will join the lesson in an active way. | 1 | 30 | 4.233 | 1.006 | 91 | 1.513 | .134 |
| | 2 | 63 | 3.825 | 1.302 | | | |
| 13. I think that ICT will contribute a lot to educational science. | 1 | 30 | 4.467 | 0.900 | 91 | 1.446 | .152 |
| | 2 | 63 | 4.159 | 0.987 | | | |
| 14. It is my dream that our students have computer assisted education. | 1 | 30 | 4.333 | 0.844 | 91 | 1.104 | .272 |
| | 2 | 63 | 4.111 | 0.935 | | | |
| 15. ICT is not suitable for our country.* | 1 | 30 | 1.533 | 0.819 | 91 | -3.365 | .001 |
| | 2 | 63 | 2.159 | 0.846 | | | |
| 16. I believe that ICT increases the quality of education. | 1 | 30 | 4.433 | 0.679 | 91 | 1.099 | .275 |
| | 2 | 63 | 4.222 | 0.941 | | | |
| 17. I think that ICT becomes a rival for a teacher.* | 1 | 30 | 1.800 | 1.095 | 91 | -1.756 | .082 |
| | 2 | 63 | 2.143 | 0.759 | | | |
| 18. I think that ICT use makes students passive.* | 1 | 30 | 2.033 | 1.066 | 91 | -1.378 | .172 |
| | 2 | 63 | 2.317 | 0.858 | | | |
| 19. I believe that audio visual materials increase the long-term learning. | 1 | 30 | 4.567 | 0.626 | 91 | 1.121 | .265 |
| | 2 | 63 | 4.397 | 0.708 | | | |
| 20. I find it difficult to use ICT in crowded classes.* | 1 | 30 | 2.567 | 1.305 | 91 | -1.285 | .202 |
| | 2 | 63 | 2.937 | 1.294 | | | |
| 21. I think that one of the biggest problems of our education system is the ineffective use of ICT. | 1 | 30 | 3.433 | 1.040 | 91 | -0.449 | .654 |
| | 2 | 63 | 3.556 | 1.305 | | | |
| 22. I think all teachers should always be informed about ICT. | 1 | 30 | 4.267 | 0.828 | 91 | -0.359 | .721 |
| | 2 | 63 | 4.333 | 0.842 | | | |
| 23. I do not need to know about ICT application field.* | 1 | 30 | 1.600 | 0.894 | 91 | -2.649 | .010 |
| | 2 | 63 | 2.095 | 0.817 | | | |
| 24. I believe that it is not necessary to use ICT to reach the special learning goals.* | 1 | 30 | 2.033 | 1.217 | 91 | -1.152 | .252 |
| | 2 | 63 | 2.302 | 0.961 | | | |
| 25. I like using ICT instruments in my classes. | 1 | 30 | 4.433 | 0.679 | 91 | 0.955 | .342 |
| | 2 | 63 | 4.254 | 0.915 | | | |

 

**Table 1**. Descriptive statistics for the attitude questionnaire.

| | Subjects | n | Mean | *SD* | *df* | *t* | *p* |
|---|---|---|---|---|---|---|---|
| 26. I believe that classes will be more productive with ICT opportunities. | 1 | 30 | 4.367 | 0.964 | 91 | 0.339 | .736 |
| | 2 | 63 | 4.302 | 0.816 | | | |
| 27. I believe that ICT is not necessary for all types of classes.* | 1 | 30 | 2.933 | 1.337 | 91 | 1.041 | .301 |
| | 2 | 63 | 2.651 | 1.166 | | | |
| 28. I have felt the lack of not using ICT since I started teaching. | 1 | 30 | 2.667 | 1.241 | 91 | -1.612 | .111 |
| | 2 | 63 | 3.079 | 1.112 | | | |
| 29. It is my great pleasure to have class with ICT support. | 1 | 30 | 4.233 | 0.898 | 91 | 0.293 | .770 |
| | 2 | 63 | 4.175 | 0.908 | | | |
| 30. I think that ICT is a source of confidence and courage for teachers. | 1 | 30 | 4.133 | 0.819 | 91 | 2.254 | .027 |
| | 2 | 63 | 3.524 | 1.366 | | | |
| 31. I think that ICT limits teachers' creativity.* | 1 | 30 | 1.833 | 0.791 | 91 | -2.721 | .008 |
| | 2 | 63 | 2.349 | 0.883 | | | |
| 32. I believe that ICT increases motivation in the class. | 1 | 30 | 4.133 | 0.937 | 91 | -1.389 | .168 |
| | 2 | 63 | 4.397 | 0.814 | | | |
| 33. I believe that the use of ICT instruments requires some skills.* | 1 | 30 | 4.100 | 0.712 | 91 | 0.823 | .413 |
| | 2 | 63 | 3.952 | 0.851 | | | |
| 34. I believe that ICT applications are necessary for more effective education. | 1 | 30 | 4.333 | 0.758 | 91 | 0.401 | .690 |
| | 2 | 63 | 4.254 | 0.950 | | | |
| 35. I think that ICT use increases teacher's responsibility.* | 1 | 30 | 3.767 | 0.898 | 91 | 1.211 | .229 |
| | 2 | 63 | 3.444 | 1.317 | | | |
| 36. I think that one of the prerequisites of being a good teacher is the effective use of ICT. | 1 | 30 | 4.000 | 0.910 | 91 | 1.316 | .192 |
| | 2 | 63 | 3.683 | 1.162 | | | |
| 37. I think that ICT limits students' creativity.* | 1 | 30 | 2.100 | 0.923 | 91 | -1.402 | .164 |
| | 2 | 63 | 2.413 | 1.042 | | | |
| 38. I believe that teacher must be dominant in the class while ICT is being used.* | 1 | 30 | 2.567 | 0.935 | 91 | -0.574 | .567 |
| | 2 | 63 | 2.714 | 1.250 | | | |

*reverse items

** the dataset related to group of instructors in 2024

 

*** the dataset related to group of instructors in 2017

In terms of age groups 20-29, 30-39 and 40-50, a one-way between subjects ANOVA was conducted and no significant differences were found between age and attitudes [F (2, 27) = 0.636, p = 0.537]. Similarly, a one-way within subjects ANOVA was used to compare the effect of working experience with the categorization of working years such as 1-5,6-10 and 11+ years of experience, there was no significant difference between the groups [F (2, 27) = 0.580, p = 0.567]. Finally, the participants in the study were also asked about their computer competency level and it was taken as a factor to see whether it had positive or negative effect on attitudes. The computer competency level of the participants was categorized into three main groups as followed: low, medium, high in the questionnaire. None of the participants stated the low computer competency level unlike the previous study held in 2017. Therefore, there were only two groups of answers regarding the computer competency: medium and high. Based on the answers revealing medium and high computer competency level, we can support the idea that instructors believe they are more advanced now with their computer after seven years. An independent-samples t-test was performed to compare attitudes of those who are in medium and those who are in the high computer competency group. The results indicated that there was no significant difference in the score of those who have medium (M=3.77, SD= 0.51) and those who have high (M=4.12, SD= 0.33); t (28) = -1.775, p = .087 computer skills. Interestingly, the variables such as age, working experience and computer competency level were observed to be significant outcome in the previous study in 2017 (Öztürk, 2017). As a result, the single most striking observation to emerge from the data comparison was the fact that maximizing the ICT use contributed in a great way to the positive attitudes of instructors and the variables appear to play no big role among EFL instructors over the years.

When the participants were asked about the frequency of their uses and their familiarity with AI tools, which is an additional section and only implemented in the second phase of the study, Figure 1 shows us the results in percentages. Google Translate (33%) and ChatGPT (37%) appear to be the most familiar AI tools for university lecturers and these two AI tools have the highest frequency of usage. When carefully checked, BardAI (70%), DeepL (70%) and DialoGPT (77%) seem to be the most unfamiliar AI tools for the participants with the lowest frequency of usage.

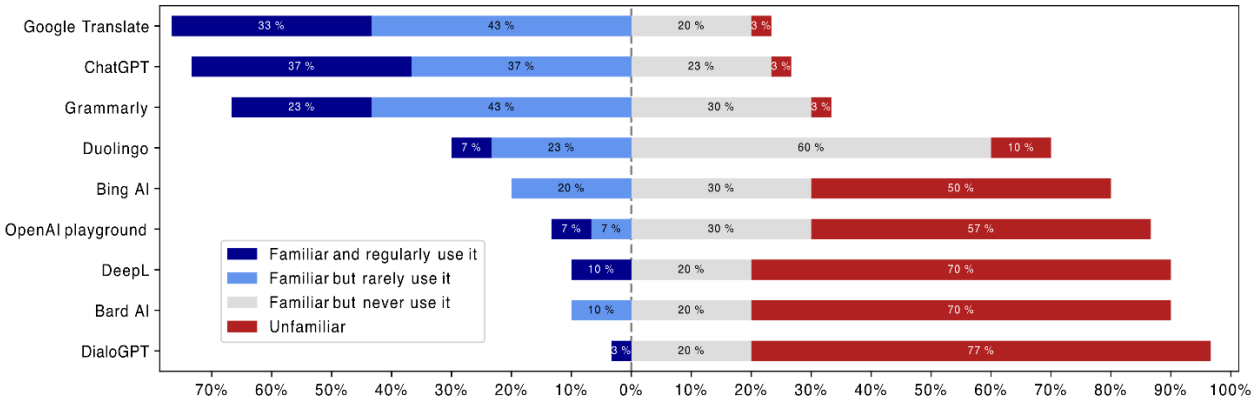


Figure 1. The percentages of the frequency of use and (un)familiarity with AI tools

### 3.2. Qualitative data results

The study aimed to identify the primary factors influencing the development of technology skills among educators over seven years. It was based on responses to an open-ended question that asked what has played the most significant role in developing their technology skills. A content analysis of the responses revealed seven key themes: pandemic/online teaching, personal interest, experience and practice, training and courses, technology and tools, necessity and accreditation and institutional requirements.

Fundamentally, most respondents (53.33%, n=16) indicated that the COVID-19 pandemic and the subsequent shift to online teaching platforms played a significant role in developing their technology skills. Comments highlighted

 

the need to adapt to various online platforms such as Microsoft Teams, Google Jam, Canvas, and Google Forms, along with creating digital teaching materials. Many respondents also attended training courses and workshops designed to facilitate effective online teaching.

Next, a significant proportion of respondents (16.67%, n=5) attributed the development of their technology skills to their interests. These individuals expressed a strong intrinsic motivation to enhance their technological competencies, further fueled by the challenges and opportunities presented by the pandemic.

Moreover, some respondents (6.67%, n=2) emphasized the importance of hands-on experience and continuous practice in developing their technology skills. This theme underscores the value of experiential learning and the iterative process of improving skills through regular use and application. Similarly, 6.67% (n=2) of respondents identified formal training and courses as crucial to their technological development. These included institutional training sessions and external seminars to enhance digital literacy and pedagogical effectiveness in an online environment. Thus, teacher training seems to be a crucial element and a particular need for the professional development of EFL instructors, which is in line with the previous study by Öztürk (2017).

Last but not least, specific technologies and tools contributed to the development of technology skills for 10% (n=3) of respondents. This theme includes using Learning Management Systems (LMS), AI-assisted platforms, and other hybrid teaching tools that facilitate a more dynamic and interactive learning experience. An additional 10% (n=3) of respondents cited necessity as a driving factor for developing technology skills. This theme highlights the adaptive response to external pressures, such as the need to ensure continuity of education during the pandemic and the broader digital transformation in education. Finally, one (3.33%) respondent mentioned accreditation processes and institutional requirements as motivating factors. This includes mandatory online teaching and seminars by the Continual Professional Development Unit (CPDU) at their schools as part of their professional obligations.

## 4. Discussion

The current investigation of attitudes towards ICT regarding the first research question has confirmed that over the seven years, EFL instructors have developed moderately positive attitudes towards ICT use in their teaching with particular emphasis on creativity, bravery, and confidence, classroom use, the importance of having an understanding of ICT applications, and the appropriateness of ICT for the nation in comparison to the former study results reported by Öztürk (2017). In fact, it is also possible that experienced teachers, especially after seven years, are even willing to combine traditional teaching strategies with ICT in their teaching. Considering the second research question in terms of the relationship between variables such as age, working experience and computer competency level, they have no significant role since it can be seen that nearly all EFL instructors have positive attitudes towards ICT use and are aware of its benefits. Part of these results coincides with those revealed by García-Martínez et al. (2020), according to whom work experience was not a predictor variable. To sum up the findings related to third question, this study reveals several key factors influencing the development of technology skills among educators. The most significant factor was the COVID-19 pandemic, which necessitated a rapid and extensive shift to online teaching platforms. Over half of the respondents highlighted the pandemic as a crucial catalyst for their technological skill development. This aligns with existing literature that underscores the transformative impact of the pandemic on educational practices globally (Bond, 2020; Daniel, 2020). The abrupt transition to online teaching required educators to quickly adapt to various digital tools and platforms, underscoring the critical role of external pressures in driving technological proficiency. However, their need for ICT training is still a central theme in supporting ICT use since participants identified formal training and courses as instrumental in developing technology skills, which aligns with other studies (Pozas & Letzel, 2023). Another research also supports this by indicating that targeted professional development programs can significantly enhance educators' technological competencies (Lawless & Pellegrino, 2007). Such training provides structured learning opportunities and resources, enabling educators to keep pace with rapidly evolving technological advancements. The respondents also noted experience and practice as key to their technological advancement. This reflects Kolb's (1984) experiential learning theory, which emphasizes learning through experience and iterative practice.

 

Engaging with technology regularly helps educators refine their skills and build confidence in using digital tools effectively. Based on the results, the study showed that familiarity with the recent AI tools is very low. Therefore, teacher training programs should offer special training focusing on the integration of AI tools into language teaching.

## 5. Conclusions

In conclusion, the findings of the recent study highlight the multifaceted nature of technological skill development among educators, driven by a combination of external pressures and personal initiative. We can confirm that the pandemic is an external pressure which caused personal initiative in terms of self-development of instructors' own ICT skills. Fundamentally, adopting longitudinal study design, we were able to identify the positive attitudinal change regarding specific themes such as creativity, bravery, and confidence, and that the variables such as age, teaching experience and computer skills seem to be no more predictor variables. Therefore, the further research might focus on the inclusion of new themes in terms of ICT attitudes as well as the other type of variables such as self-reported ICT skills rather than demographic variables. There is a clear need for ongoing support and training for educators, particularly in leveraging technology for effective teaching and learning, including the latest developments in AI tools. As a result, continuous professional development is essential in creating positive attitudes. By addressing these points, institutions can better prepare educators for the evolving demands of the digital age. The insights gained from this study have important implications for educational institutions and policymakers.

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# Integrating digital movie-making projects in EFL teacher training

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***Abstract***

*This paper presents the results of a content analysis of 102 multimedia projects (video movies) made by EFL teacher trainees during two semesters of 2023-24 academic year. The video-movies were submitted by students as outputs of their literary and culturally enriched school trips in Anglophone countries. The aim of the research was to identify dominant strategies future EFL teachers incorporate while creating their video projects. The second aim was to learn which digital tools they use and with which effect. Last but not least, the research intended to observe how EFL future teachers evaluate the impact of their video project-making process on their language and personal development. The results proved the growing popularity of the technique among EFL teacher trainees (comparing to the pilot research in 2022/23) even though majority of them (over 80%) stated they were not specifically trained in digital movie-making, they first did not feel competent enough and they would welcome such training. To fulfil the task, the students used a wide range of digital movie-making tools (17 in total). In general, the EFL teacher trainees appreciated the opportunity and were aware of numerous ways they can benefit from such digitally enhance education both professionally and personally.*

***Keywords:*** *project-based language learning; multimedia projects; digital video movie making; EFL teacher training.*

## 1. Introduction

Since its first steps in the 1950s, CALL has developed into a broad branch of applied linguistics characterized by incredibly changing nature. As Beatty (Beatty, 2010, p. 7) has it, CALL accommodates any process in which a learner uses a computer and, as a result, improves his or her language. It "has come to encompass issues of materials design, technologies, pedagogical theories and modes of instruction". Lately, the CALL community seems to be fascinated by latest developments in AI-powered technology/generative language models. However, it is equally important and we cannot forget to study and analyse pedagogical impact of other, maybe more traditional CALL developments on language learning processes within mainstream language classrooms (i.e. classrooms consisting of learners and taught by teachers who both are regular users and consuments of modern technology without any ICT expertise knowledge or programming training). This paper focuses on applying the method of digital movie-making as a tool for improving (not only) language skills and for developing foreign language cultural knowledge of future English as a foreign language teachers enrolled to courses at University of Trnava.

 

Within foreign language education, students are accustomed to frequent viewing videos and using them as a sourse for consequent discussion or any other type of language excercies. As part of general pedagogical trends opening opportunities for more active, personalized and autonomous learning, learners are nowadays frequently encouraged to create their own foreign language movies, since required technology is now more accessible and more feasible than ever. Nowadays, students can choose from numerous inexpensive and easy-to-use video editing programs and software (intelligent or not). Digital video editors enable students to record and collect materials, sequence video clips, add audio, overlay titles, and experiment with transitions (Ivers & Barron, 2002). When the project is complete, they can export it to digital presentations or publish them online. If organized by an instructor, creating video-movie projects within foreign language learning usually runs in three phases: pre-production, production, and post-production (see Fig. 1).

**Phases of Digital Video Projects**

| Pre-Production | Production | Post-Production |
|---|---|---|
| • Select project idea/goal<br>• Outline project<br>• Write scripts and storyboards<br>• Assign roles<br>• Design sets (if necessary) | • Shoot video<br>• Record audio<br>• Create graphics<br>• Digitize all analog elements | • Import video into editing software<br>• Edit video clips<br>• Add transitions<br>• Add title slides<br>• Combine the clips into movie file |

Figure 1. Phases of digital video projects (source: Ivers & Barron, 2002, p. 112).

### 1.1 Impact of digital movie making on students´ learning

It is believed that producing digital movies (as a specific form of creating multimedia projects along with digital presentations, e-posters, e-books, audiobooks, podcasts, blogs, vlogs, etc) is a more powerful way of learning than studying already produced and ready-made materials. Similarly, digital movie making also supports knowledge construction since it "encourages divergent thinking, multiple modes of expression, goal setting, critical thinking skills, teamwork, opportunities to revise and rethink, and more. Students are active participants, constructing knowledge that is meaningful, applicable, and memorable (Neo & Neo, 2009). The act of creating digital movies (as multimedia projects) addresses all criteria set for contemporary education: 1) multimedia projects allow students to focus on course content through problem-solving tasks; 2) they promote active and cooperative learning; 3) the process of creating multimedia projects engages students in higher-order thinking skills; 4) students are led to present and represent ideas through a variety of media; 5) they develop their digital skills via manipulating various technology tools, 6) they intentionally learn how to critically analyse, evaluate, and organize information. Creating digital movies as multimedia digital projects is one of the important competences that should be part of quality education in any field. English language teacher training is no exception, all the more so because future teachers will one day develop the competence in their future pupils.

### 1.2. Literature review

Video movie is one of the most frequently used media by EFL teachers to present classroom materials to students and as such various aspects of their using in the EFL classrooms are routinely studied and well discussed. Research of movie making by students is studied in a considerably lesser amount. Nearly 10 years ago, Huang (2015) conducted an in-classroom evaluation study on the effects of video projects on motivation and language learning in EFL learners. The study lasted for 14 weeks. Students spent the first 8 weeks by chosing a topic, looking for information related to the chosen topic, and creating voice blogging. In the next four weeks, students used collected materials and wrote a video project script. In the last two weeks, students edited video movies, presented them to their peers. The process was finalized by mutual peer evaluation of all movies and conducting interviews. The

 

author concluded that students felt intensively motivated by the activity (in his context, a fun factor was named specificaly). Students recognized video making as the experience of learning by doing and using English for authentic purposes. Students faced no problems with gaining and developing the technical skills needed for making videos. The only challange they named was the demand for a lot of time in making videos.

A series of research studies was interested in possible effects of digital movie making as students´ projects on developing EFL students´ language communicative skills. Aksel & Gürman-Kahraman (2014) wanted to determine the effectiveness of video project assignments (VPA) on foreign language learning. 100 students from the Uludağ University in Turkey were asked to respond through a questionnaire how their video project assignments contributed to their English language learning process. The quantitative analysis of the data showed that the students had positive or neutral perceptions on the effectiveness of the VPAs for their language classes since none of the items in the research instrument received negative overall mean values.

Pusba (2016) carried out research to observe the most developed English skill in each phase of video project implementation, as well as to find out whether the students perceive student-made video project as positive learning experiences. The results gained from close-ended questionnaire responded by 31 students revealed that in the preparatory phase the students stated that they develop their writing the most, in the production phase speaking skill was trained the most, and in the video presentation phase the students' reading and listening were the two English skills that developed the most. Moreover, the students also viewed the project as positive learning experience in developing 21st century skills. In their opinions, these skills included self-directed, knowledge creation, collaboration, and digital literacy.

A positive effect on improving speaking skills was proved also by Puspa Sari & Wardarita (2018) who publieshed results of a pretest-posttest experimental study. The results confirmed that video projects had significant influence on the participants' speaking - participants were found more fluent and communicative in their videos. On the contrary, results obtained by Sari et al. (2020) via analysis of reflections written by the participating students did not confirmed such influence. The study indicated that English language skills of participating students were not significantly improved after their movie-making projects were finalized. Instead, the study indicated improvements in additionally observed areas such as the development of team work skills, ability to manage stress, technological ability and creativity.

In their research study conducted in the General English Language Course at Srinakharinwirot University, Thailand, Kulsiri (2018) aimed to study students' perceptions of a SPV (student-produced video) projects. 450 first year students with a pre-intermediate level of English language proficiency, who were enrolled in the General English Language course, were assigned to work on a SPV project that required them to make a short video related to content learnt in class. The author seeked to fulfil four main objectives: 1) to provide an environment that allows students to grasp a deeper understanding of the topic learnt in class; 2) to enhance English language proficiency as well as creativity and problem-solving skills; 3) to promote the use of ICT in language teaching and learning and 4) to provide a collaborative working environment among students. 107 students responded to the questionnaire. Findings proved that students had positive perceptions toward the SPV projects in three aspects: 1) they believed they had improved their English language proficiency and life skills, (2) they positively acknowledge the use of technological tools in the learning process, and 3) they appreciated collaboration with and among peers.

The qualitative research of students´ opinions and perspectives on utilizing ICT in video-making project to teach EFL conducted and published by Mazulfah & Suriyah (2022) involved 12 students in making EFL-focused video movies and consequently collected their responses through interviews and questionnaires. The result showed that the respondents enjoyed the activity of movie making and considered it "very important" for their learning. They felt the activity helped develop their English literacy and made the learning process more fun. Students utilized ICT most when searching for materials and used many video editing applications when producing the final product. The challenges the respondents mentioned included: technical problems (i.e. poor internet network, lack of editing skills; limitations of some video-editing applications, and organizational problems related to working in groups during Covid-19 pandemic.

The aim of the the present research was to continue in above mentioned observations in the academic year 2023/24, as well as to identify dominant strategies future EFL teachers incorporate while creating their video projects

 

comparing to other groups of university students. The second aim was to learn which digital tools they use and with which effect. Last but not least, the research intended to observe how EFL future teachers evaluate the impact of their video project-making process on their language and personal development.

## 2. Methods

### 2.1. Context and participants

The present research study directly follows and builds upon the results of the recent action research study by Pokrivcakova (2023) whose aim was to test the applicability of movie-making projects as effective EFL teacher-training assingnments. The study was carried out during 4 consecutive semesters (academic years 2021/22 and 2022/23) within 4 courses which included excursions to English-speaking countries and the subsequent movie making as a multimedia project. 72 multimedia projects were submitted for final evaluation, of which 66 were considered video movies. The opinions and attitudes of participating students towards movie-making were obtained through a standardized "subject survey" administered by the university. The analysis of the submitted movies proved that EFL teacher trainees were able to create attractive video movies even though no prior training on how to use movie-editing applications was offered (however, several students would have welcomed the opportunity). A significant majority of the projects (87.5%) included up to 4 of the 5 media components: text, images, sound and video. Only two projects included animations. When creating their multimedia projects, students preferred working in small groups of 2-3 students. Students prefered to make short films (the average length of the submitted projects was 7'24"). The results published by the university in "the subject survey" indicated high levels of students´ satisfaction with the subjects (4.7 in average out of max 5). All the students involved found the completion of these courses to be fully beneficial. They agreed that through making digital video-movies they had gained new knowledge necessary for their future study and both personal and professional life.

### 2.2. Research methodology

This paper presents the partial results of data collected through three methods from three sources. First, to fulfil the first research objective, a content analysis of 102 multimedia projects (video movies) made by EFL teacher trainees during two semesters of 2023-24 academic year was conducted. Within it, three aspects (codes) of the final projects were observed/measured and analysed: a) structure of the author teams; b) duration of a final movie project (time in minutes); c) structure of media involved (text, sound, images, animations, video). These analytical results were then confronted with students´ responses collected from their analytical sheets submitted by video movie authors along with their video movies. The analytical sheet (Appendix 1) was issued by teachers supervising Anglophone study trips at University of Trnava and when filled-in, they are used by the university for registration and archivation of all students´ works. One item of the analytical sheet was directly related to the topic of the present paper: "What digital tools did you use for producing your multimedia project – video movie?". Students´ responses on this analytical sheet item were anonymised, quantified and statistically processed by the author of the present study, which enabled het to fulfil the second research objective. Finally, the data necessary for fulfuiling the third research objective, were gained through a central "subject survey" organized by the university after closing each semester. The survey (Appendix 2), consisting of 3 likert scales and one open-ended item, was created, administered and data was collected by the university authorities without any direct involvement of the paper´s author. Hoawever, data from the university survey are published here with the permission of the university authorities.. Within this study, the impact of movie making on the level of students´ EFL communicative skills or their (inter)cultural knowledge were not analyzed.

## 3. Results

In the academic year 2023/24, 102 multimedia projects from Anglophone study trips were submitted for final evaluation and analyzed for this study (Table 1). Thanks to more precisely defined assessment criteria, all the projects submitted in this period (N = 102) were in the format of video movie (in the previous periods, students

 

submitted also other formats, such as illustrated texts or audio digital presentations - PowerPoint with sound). Similarly to previous research study (2021/22 & 2022/23; c.f. Pokrivcakova, 2023), students preferred making their videos in groups. More than three quarters of the projects were formed by teams with two or three students (85 teams out of 102, which is 83.33%).

**Table 1.** Structure of author teams

| | **Bc.** | **Mgr.** | **N** | **%** |
|---|---|---|---|---|
| 1 author | 5 | 4 | 9 | 8.82 |
| 2-3 authors | 67 | 28 | 85 | 83.33 |
| 4 or more authors | 6 | 2 | 8 | 7.84 |
| **Total** | **78** | **34** | **102** | **100.00%** |

The assessment criteria stated a minimal length of the project´s duration of 7 minutes. The length of final projects ranged from 7'03" (the shortest project) to 18'12" (the longest project). The average length of the submitted projects was 8'23" (the value is considerably longer than the value observed in the previous study, t = 7´24"). Table 2 summarizes the representation of the involved media as communication components. All submitted projects contained video and sound (100.00%). 82 projects (80.39%) incorporated texts in any format (e.g. opening and closing titles, subtitles, labeles, etc.). 68 projects (66.66%) included images as static visual materials (e.g. pictures, drawings, etc.). Comparing to previous study in 2021/22 and 2022/23, the number of projects with original animations grew considerably to 19 projects, which, however, still remains the rarest component of student-made video movie (18.63%). The typical format of a multimedia project (students´ digital video movie) remains the same - a short video film edited from their own video footage, supplemented with images (photographs) and text components in the form of captions and subtitles, which probably reflects the average level of movie-making and editing skills of a mainstream EFL teacher trainnee.

**Table 2.** Structure of the projects according to the communication media involved

| | **Data collected in 2021/22 & 2022/23** | | **Data collected in 2023/24** | |
|---|---|---|---|---|
| **Media involved** | **N** | **%** | **N** | **%** |
| Text | 63 | 87.5 | 82 | 80.39 |
| Images | 72 | 100 | 68 | 66.66 |
| Sound | 70 | 97.22 | 102 | 100 |
| Animation | 2 | 2.77 | 19 | 18.63 |
| Video | 65 | 90.27 | 102 | 100 |
| Reference value | 72 | 100 | 102 | 100 |

The second research objective of this study was to learn which digital tools students preferred for making their movies. The data were collected from regular analytical sheets (N = 102 responses) the students submitted along with their multimedia projects as part of their assignments (an administrative requirement). In their analytical sheets, students named 17 movie-editing applications they used to create their movies. The list of mentioned digital tools included: Adobe Premiere, Animaker, Animoto, Canva, CapCut, daVinci, Filmora, iMovie, InShot, Kinemaster, Movavi, Photo Editor, PicsArt, TikTok, Tweencraft, VN, and Windows Movie Maker. Most

 

frequently mentioned applications were Canva (32 responses, 31.37%), TikTok (29 responses, 28.43%), and Windows Movie Maker (11 responses, 10.78%).

The last question the present study searched answers for was to find out how the respondents evaluated the impact of movie-making assignment on their language and personal development. The data were collected from the official university "subject satisfaction survey" the university organizes after each semester (namely, only one item out of all ten was analyzed for the purposes of this study). Published results of "subject surveys" from both semesters under review repeatedly indicated students´ high satisfaction (the mean score was 4.48 points out of max 5 points) with the observed courses (study trips to Anglophone countries) where final assignments included creating original digital movies. All the responding students (100%) considered the task of movie making as highly beneficial. They agreed that they were developing their already acquired knowledge and gaining new knowledge (the mean score 4.92 out of max 5 points).

## 4. Discussion

Similarly to previous observations by Aksel & Gürman-Kahraman (2014), Huang (2015), and Mazulfah & Suriyah (2022), the participating EFL teacher trainees were able to create video movies with help of free-access online software or mobile applications without any special training in using specific movie-editing digital tools. They reported no serious problem or lack of basic digital skills. Our respondents perceived the assignment as useful and generaly beneficial both for their professional and personal lives, which confirms results gained by Kulsiri (2018) and Pusba (2016). Comparing to previously published observations (Pokrivčákova, 2023) conducted in the same context (i.e. in the selected EFL teacher training courses at Department of English Language and Literature of the Faculty of Education at the Universty of Trnava) in previous two academic years (2021/22 and 2022/23), the trend of students´ preference to create movies in smaller groups (2-3 members) was confirmed. Technically, the tendency towards more dynamical forms and media could be traced. In average, movies created in the last academic year incorporated less texts (-7.11%) and images (-33.33%) as stable media and included more video elements (+9.73) and animations (+ 15.86) as dynamical media.

## 5. Conclusions

The aim of the the present research was to identify dominant strategies future EFL teachers incorporate while creating their video projects. It was observed that when creating video movies as course assignments, EFL teacher trainees continually prefer working in smaller groups (2-3 members). All five media elements (images, sound, video, test, animation) were incorporated in the projects; however, the significant shift from static elements (text and images) to more dynamical elements (video and animations) was observed. Future EFL teachers were able to choose and use a relatively wide range of digital movie editing tools (17 in total) without any previous formal training. Generally, EFL future teachers appreciated the positive impact of video project-making on their language and personal development. Finally, they welcomed the opportunity and recognized possible benefit such digitally enhance education can bring them both professionally and personally.

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## Appendix 1
## Analytical sheet

**A** ***Required information**
**Student's name*:**
**Study programme/year*:**
**Subject code*:**
**Country/city visited*:**
**Movie title*:**
**Your author's share in percentage*:**

**B** **Optional data:**
Completion of the following section of the analytical sheet is optional. By completing it, you are giving the instructor permission for your (anonymised) answers to be used for research purposes. Your answers in Section B will in no way affect the evaluation of your video movie or your final evaluation.

**Did the study trip improve your knowledge of a particular Anglophone country and its cultures?**
strongly agree / agree / not sure / disagree / strongly disagree
**Did the study trip improve your English language skills?**
strongly agree / agree / not sure / disagree / strongly disagree
**Did the study trip motivate you for further studies?**
strongly agree / agree / not sure / disagree / strongly disagree
**How satisfied are you with the form of the study trip output - a video movie?**
very satisfied / satisfied / neutral / dissatisfied / very dissatisfied
**Evaluate the difficulty of making a video movie:**
very easy / easy / don't know / difficult / very difficult
**What tools/applications did you use while making the movie?**
**How do you rate your digital skills?**
I'm an expert. / I'm good. / I'm an ordinary user. / I'm not good. / I'm a digital anti-talent.
**Has moviemaking improved your digital skills?**
strongly agree / agree / don't know / rather disagree / strongly disagree
**How do you feel about the fact that the student arranges the study trip (airfare, accommodation, insurance) himself/herself?**
**Your comments on the organization of the course?**

**What should we do differently?**

Thank you!

## Appendix 2
## A form of the TRUNI "subject survey" (original in Slovak)

| Course | Statement | Evaluation |
|---|---|---|
| **1. Literárno-kultúrna exkurzia - XAJJB337** | 1. The teacher observed the formalities of teaching (e.g., arriving on time for class, class is not cancelled without a refund, the teacher observes office hours, etc.) | 1 - Strongly agree<br>2 - Agree<br>3 - Not sure<br>4 - Disagree<br>5 - Strongly disagree |
| | 2. I consider the course… | 1 - fully beneficial, developing already acquired knowledge and bringing fundamentally new knowledge<br>2 - partially beneficial, linking and developing already acquired knowledge<br>3 - I do not have a strong opinion<br>4 - rather unhelpful, slightly developed already acquired knowledge |

| | | |
|---|---|---|
| | | 5 - completely unhelpful, repeated knowledge already acquired |
| | 3. My assessment of the course | ***** (excellent)<br>****<br>***<br>**<br>*(poor) |
| | 4. My comments | |

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# Teaching dictogloss as a classroom activity to student EFL teachers using classroom response tools

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***Abstract***

*This paper reports on an evaluation of a workshop to introduce dictogloss procedures to a group of student EFL teachers using classroom response system (CRS) tools in a high-tech learning environment. Response tools allow students to interact anonymously with the projector/interactive whiteboard (IWB) using their own devices (computer, tablet, smartphone etc) not only synchronously in the classroom but also remotely and asynchronously. For shyer, more introverted students reluctant to participate orally in the lesson, interaction via their own mobile devices permits an alternative avenue towards a more active participation in classroom lessons. The response tool used was Wooclap which was fully integrated into the students' Moodle VLE. Dictogloss is a well-established listening comprehension activity based on dictation in which a short text read to learners is re-constructed and reformulated in pairs. The activity permits a focus on linguistic form within the context of a communicative classroom. Results from the three response tasks indicated a high level of involvement and response among the student teachers.*

***Keywords:*** *dictogloss; classroom response system tools; pre-service teacher training.*

## 1. Introduction

This paper describes a workshop project to introduce *dictogloss* as a practical teaching acvitity to a group of pre-service German student teachers of English using classroom response system (henceforth CRS) tools. Dictogloss is a classroom activity in which learners listen to a short text read by the teacher twice and then attempt to recreate the text in writing as accurately as possible. In presenting dictogloss for the first time to student teachers, it is necessary to ensure their continual focus on the procedural stages of the activity in addition to linking these practical concerns to second language acquisition theory. CRS tools were used in the context of this workshop in an attempt to ensure that this focus and involvement was maintained throughout the activity. A secondary objective of the activity was to demonstrate the efficacy of using CRS tools in the EFL classroom at lower secondary (approximately 12-16 years) level. Learners at this level are often very self-conscious and may sometimes be reluctant to participate actively in oral activities; instead they can be encouraged to respond using mobile devices linked to the CRS tools via projector/IWB.

The author of this paper with many years of experience training teachers of English for the state school sector sees *dictogloss* as bridging the gap between language acquisitional theory on a teacher training course and a set of practical procedures for the classroom. The demonstration of the activity as part of a teacher training programme

requires that student teachers not only understand the theoretical underpinnings in terms of SLA theory but are also able to follow the various stages of the activity in terms of lesson planning. In Nation's (2007) terms, text reconstruction as an activity provides learners with a meaning-based input (the *dictogloss* text in the form of a personal anecdote, short story or historical event etc) but at the same time provides the opportunity for language / form focused learning.

*Dictogloss* is a well established teaching activity with a long pedigree in language teaching circles. *Dictogloss* activities can serve as the basis for the joint reconstruction of a short text in pairwork dyads. *Dictogloss* can be best described primarily as a listening activity but with an additional focus on writing and speaking in which the teacher reads a short text to the learners. Learners listen to the text once without making any notes before listening for a second time, making notes on the essential points from the talk, noting down significant words. Their task is to work in pairs or groups to reconstruct the text as accurately as possible paying attention to both grammatical form and lexical usage in addition to ensuring that the factual contents/ information of the text are correct. CRS tools can serve to display in class text reconstruction responses from a group of learners.

Since 2008, with the introduction of *Padlet,* a number of CRS tools have appeared, enabling learners to interact with the projector /IWB interactive white board, sharing written language products of the interaction. Tools such as *Mentimeter*, *Lumio*, *Padlet* , *Kahoot!* and *Wooclap* can help shy and reticent pupils/ students to participate more fully in classroom interactive sessions. A key point to make here is that responses are made anonymously and learners can participate without fear of being singled out for negative reasons. Research on the impact of CRS tools at tertiary level has pointed to many benefits in terms of the modernization of university teaching and the move away from traditional transmission lecturing (Adams and Columba 2014; Aktekin, *et al*. 2018; Garcia-Lopez and Garcia-Cabot, 2022).

The CRS tools mentioned above, offer very similar functionalities, supporting real-time responses and providing instant feedback or results which the teacher can display to the audience. A variety of question types may be used including multiple-choice, open-ended, polls, word clouds and quizzes. *Kahoot!* however has a more explicit focus on game-based learning and competition, possibly lending itself more readily to younger age ranges. However all the main CRS tools offer functionalities leading themselves to dictogloss activities.

In terms of dictogloss activities, learners can share textual their reformulations of the original reading via the response tool on the classroom IWB or projector, encouraging in Schmid and Frota's (1986) terms the *noticing* of grammatical, lexical and orthographical errors. Such a procedure can serve to assist in the development of the pupils' interlanguage systems as they notice the gap between their formulations and the original text as read by the teacher.

With the increasingly digitalized nature of classrooms in technologically advanced classroom learning environments, a number of classroom response system (henceforth CRS) tools have emerged over the past 20 years or so to promote active pupil / student interaction in the classroom. These tools have often been compatible with the parallel introduction and development of interactive white board (IWBs) technology although of course these tools can be also used with a projector and are not restricted to genuine IWBs. The posing of genuine and display questions for pupils to answer has of course always been a distinctive feature of the communicative classroom as teachers have increasingly striven to break away from 'one-way' transmission-based teaching in favour of interaction and collaborative practice. The development of user-friendly tools such as *Padlet*, *Mentimeter*, *Wooclap*, *Wordwall* and *Lumio* to name but a few examples can provide the basis for active written pupil / student participation in the lesson in addition to the encouragement of real-time assessment and feedback, leading to an inclusive learning environment.

The earliest examples of CRS tools where based on a simple 'clicker' response buttons on a handheld device but the trend has been towards the development of more versatile web-based platforms suitable for both IWB and non-IWB usage. These platforms can provide teachers with more or less instantaneous real-time feedback on their teaching, leading to re-adjustment and re-formulation where necessary. Additionally interactions can offer checks on understanding and data-driven input where responses remain logged on the platform while at the same time

ensuring annoymity of the respondents which is all important with adolesent learners at a sensitive point in their lives. In certain classroom environments, language anxiety is often an obstacle to active lesson participation. CRS tools now encorporate possibilities for the gamification of learning activities which can serve as a source of motivation. With a more conventional transmission approach to teaching, research has shown rapid dropping off of attention and engagement following the initial opening phase (Allison 2020). When paced as regular intervals throughout a lesson, these response activities can help to ensure that the students' focus is maintained across the lesson period. Another advantage in view of the recent pandemic is that students can respond to the questions remotely.

**Dictogloss as a classroom procedure**

The British Council, a key organization in language eduction worldwide has recognized *dictogloss* as a key activity in EFL teachers' professional development and is highlighted on the organisation's overview of practical classroom activities for new teachers[1]. In Richards' (1982/2001) systematic description and comparison of language teaching methods, three levels are recognized in the design process: *approach* as a theory of language and language learning, *design* specifying linguistic content organisation and learner / teacher roles with a dictogloss activity representing a *procedure* as an outline of individual classroom steps and procedures.

*Dictogloss* is not word-for-word dictation in the manner of a court stenographer, trained in shorthand, transcribing verbatim for example the details of a trial. Thornbury (1997) sees dictogloss foremost in terms of text reformulation and reconstruction, connecting the procedure with research on learners' attention to linguistic form, driving in turn the conversion of *input* into i*ntake* in L2 acquisitional terms. The '*-gloss*' element here is important; learners must use their existing interlanguage knowledge to formulate their own rendition of the text. Teachers can use the procedure to help learners to cognitively compare in Ellis's (1995) terms their current formulations with the target language variety, as *explicit* knowledge of linguistic form becomes *implicit*.

The author's decision to focus on *dictogloss* for the purposes of the present reflective practice study was made on the following basis:

- *dictogloss* has a long pedigree in comunicative language teaching
- the activity ties in well with several prominent strands of research in second language acquisition in terms of learners 'noticing the gap' in Schmidt and Frota's (1986) terms between their ongoing interlanguage development stage and the target language system.
- the activity has a number of easily identifiable stages and can be adapted for different proficiency levels from pre-intermediate to advanced (roughly B1 and above).
- the activity involves primarily receptive (listening) skills but additionally productive skills in writing and speaking

## 2. Method

### 2.1 Outline and participants

The procedure employed was follows. *Dictogloss* was demonstrated as a classroom learning activity to a group of student teachers in the German state system during the course of their second term of studies. Student teachers were aged between 20 and 28 years old; 70% were female. Students had previously studied an introductory course covering second language acquisition and language teaching methodologies. The intention was to demonstrate an practical activity for the classroom grounded in L2 acquisition research. The author of this article outlined the activity using a practical *dictogloss* example designed for a more advanced EFL classrom which is typical in Germany, roughly advanced B2 / C1 and above. Students were also shown a short video demonstrating a dictogloss

[1] https://www.teachingenglish.org.uk/professional-development/teachers/knowing-subject/d-h/dictogloss

activity taken from Harmer (2015) in which a teacher read a text based on a personal anecdote of receiving a present at Christmas[2]. The example *dictogloss* text used for the present workshop was written by the author himself, based on a short summary of the events surrounding the historical AD79 eruption of the volcano Vesuvius and the destruction of the towns Pompeii and Herculaneum as described originally by the Roman historian Pliny the Younger. The *dictogloss* text as read to the students is set out in the Appendix.

The lesson outline is included below (Figure 1) as presented to the student teachers (reproduced from the original Powerpoint presentation).

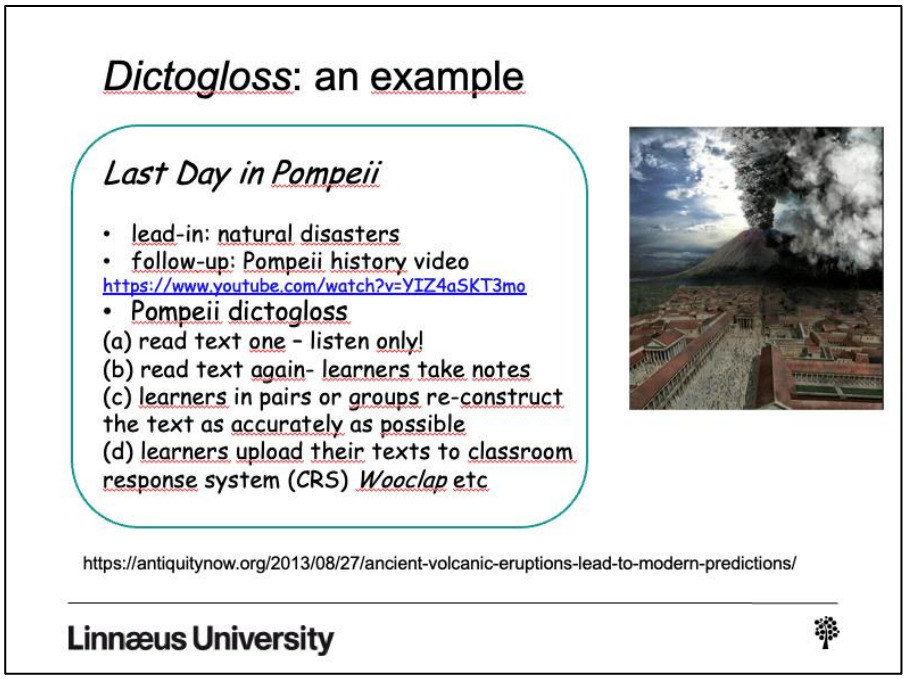



Figure 1. Lesson outline for dictogloss

The CRS used for this activity was *Wooclap*. *Wooclap* is supported and fully integrated in the university's *Moodle* virtual learning environment. *Wooclap* represents one of the latest CRS suites at the time of writing (June 2024) with possibilities for creating quizzes, polls and AI-enhanced content in addition to providing presentators with a range of ready-made templates.

An example from one of the response questions is reproduced in Figure 2 below.


Figure 2. Wooclap participation page.

[2] https://youtu.be/SB53j1e6vG0?si=h7Hgezin0pwh8HK0

### 2.2 Procedure for introducing dictogloss

The lesson presentation began with a lead-in on the subject of natural disasters to elicit the vocabulary relevant to the area (*tsunami*, *earthquake*, *flashflood*, *landslide* etc). An excerpt from *YouTube* (3 minutes) describing the Versuvius eruption and its effect on the nearby Roman settlements of Pompeii and Herculaneum was then played on the projector. The follow-up to the video excerpt included questions to focus on bottom-up (understanding of specific words in the video, such as *pyroclastic*, *pumice* etc) and top-down listening (the general gist of what happened to Pompeii). The text was read at ´normal speaking speed'[3] for the first time with students under strict instructions not to take any form of notes on paper or screen during the course of the reading. The text was then read for second time roughly at the same speed of delivery; this time student teachers could take notes. Student teachers were told that it would be more or less impossible to take down the words exactly as they were in the text; this is an essential part of the dictogloss activity which is to broadly capture the factual contents and to permit the reformulation of grammatical and lexical usage where necessary. The next stage of the process involved pairing up students who were then encouraged to compare their notes and to collaboratively assemble the elements taken down in the form of a re-assembled final text. Finally each pair uploaded anonymously their texts to *Wooclap* for display on the projector. These stages are reproduced in Table 1 below.

Table 1 below provides an overview of the main parts of the workshop, with the three main CRS activities using *Wooclap* designed from the outset to create the basis for interaction with the students. The first CRS activity served as the basis for connecting with the student teacher's previous studies in language education and the communicative language classroom relevant to dictogloss. The second CRS activity involved the publishing and anonymous display of the re-assembled dictogloss on the *Wooclap* platform, while the final CRS task revolved around an short evaluation of the activity in response to the following question:

*What do you see as the main advantages and disadvantages of using dictogloss as a classroom activity?*

**Table 1.** Lesson stages

| Lesson sub-component | Description |
|---|---|
| **CRS Wooclap task I** | lead-in: What is a good lesson for you at upper secondary level? Discussion of responses in terms of focus on communication and linguistic form. |
| Introduction to dictogloss | Powerpoint PPT: introduction to the stages of dictogloss |
| Dictogloss example | *Last Day in Pompeii*<br>• lead-in natural disasters<br>• video<br>• first text reading<br>• second text reading (students took notes)<br>• dictogloss text reconstruction (in pairs) |
| **CRS Wooclap task II** | uploading text and noticing exercise |
| **CRS Wooclap task III** | classroom reflections on and response to the *Wooclap* activity. |

The analysis of results was made on the basis of the learning analytics functionalities built into *Wooclap*, permitting both quantitative and qualitative analysis of the student teacher responses. These functionalities permitted the

[3] From a 'teacher talk' perspective, no adjustments were made either in terms of speed from the author's normal speed of delivery. No intonational or emphatic exaggerations were made either to make the text easier to understand.

counting of individual student teacher responses and a qualitative examination in response to the open-ended questions.

## 3. Results

The results of the three CRS interactions will now be presented. There were a total of 33 students in the classroom organized into 15 pairs and one group of 3 , using a mixture of mobile phones, tablets and laptop computers to participate in the session. Some students used the login address and code to connect with the *Wooclap* platform while others scanned the QR screen with their phones. The results will be given in the formof screenshots of the *Wooclap* display page.

### 3.1 CRS Wooclap task I

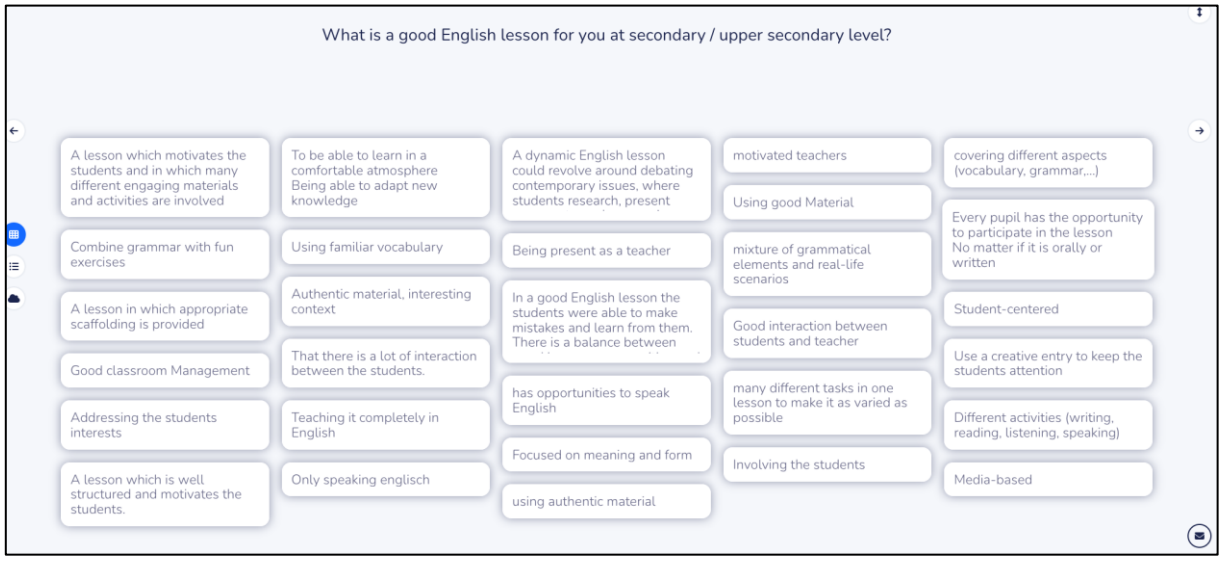



Figure 3. Screenshot from *Wooclap* showing responses to the first question

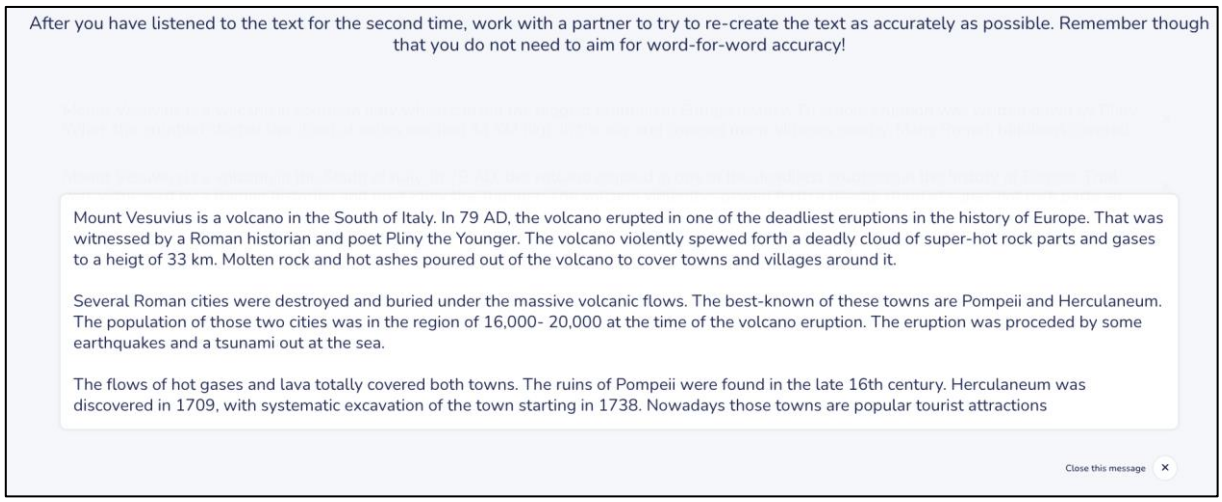
This activity was an ice-breaker / warm-up designed to connect with previous studies in linguistics, L2 acquisition and language teaching theory and methods. The responses reveal a group of students familiar with the broad linguistic and pedagogical prerequisites of a communicatively focused foreign language classroom

### 3.2 CRS Wooclap task II

This part of the workshop involved each pair re-assembling the original text from their notes taken from the

second reading of the text.

*Dictogloss response A*




*Dictogloss response B*


Figure 4. Wooclap dictogloss responses

Due to lack of space, the *dictogloss* responses A and B for two student pairs only are displayed here. Typical of *dictogloss* responses, the screenshots from the platform here reveal various differences in terms of the factual information covered from the original text and different lexicogrammatical devices for conveying the information- compare for example the expression of geographical setting in the *South of Italy* with *southern Italy*.

Pairs were then asked to choose one of the re-assembled texts other than their own to highlight any lexical,

grammatical or orthographical errors. In the case of text B, this resulted in:


Figure 5. Corrected version of dictogloss B

Errors underlined on the board and word omissions highlighted.

### 3.3 CRS Wooclap task III

The question regarding the advantages and disadvantages of *dictogloss* brought about a variety of responses.

The two intended final questions were scrapped due to lack of time workshop session.

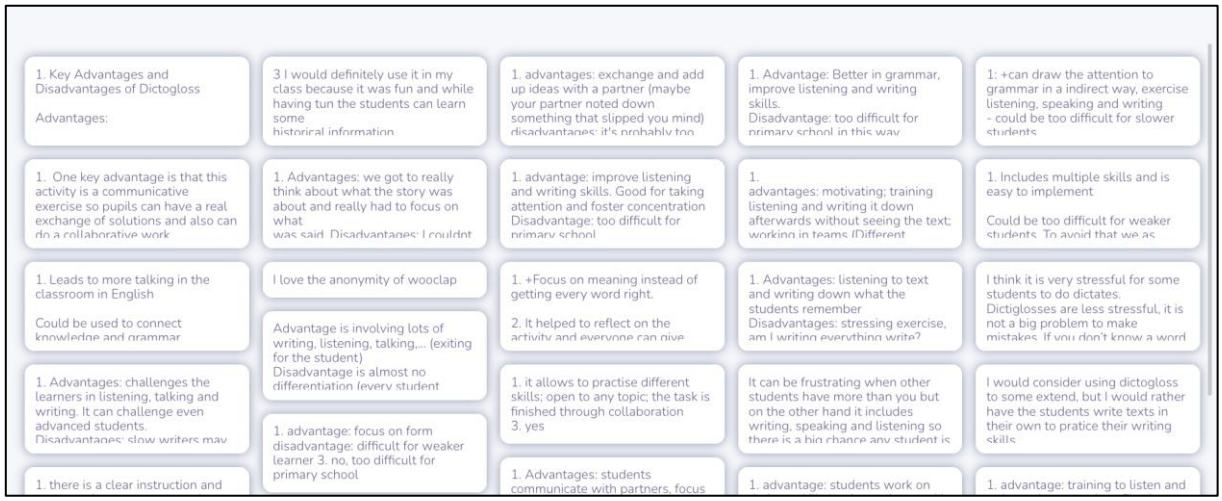



Figure 6. Some of the responses to the evaluation question displayed on *Wooclap*

## 4. Discussion

This dictogloss activity was in the form of a single workshop which aimed to introduce dictogloss to a group of student teachers working in a high-tech relatively advanced EFL context while at the same time demonstrating the efficacy of using a classroom response tool like Wooclap to encourage interaction and participation among

the teachers.

**Table 2.** Responses to the CRS tasks

| CRS task | Numbers of responses | Percentage of audience actively responding (max 33 students) |
|---|---|---|
| CRS Wooclap task I | 30 | 90% |
| CRS Wooclap task II | 29 /14 pairs) | 88% |
| CRS Wooclap task III | 28 | 85% |

As can be seen in Table 2, a high proportion of the audience of student teachers responded to the three separate CRS activities paced throughout the workshop. Respondents to the final evaluative *Wooclap* task pointed to the advantages in combining multiple language learning skills particularly with regard to listening comprehension with a focus on text reconstruction. One respondent immediately understood the advantage of dictogloss over a standard dictation activity Dictogloss is open to any subject area but might be too difficult for the primary sector. The task provides a challenge for the more advanced learners but was seen by some respondents as being difficult for weaker pupils.The anonymity of the exercise was appreciated by a number of respondents; individual learners and their language errors are not singled out by name but at the same time the CRS allowed learners to focus on their linguistic errors and how they might be corrected by each other / the teacher. Some respondents appreciated the collaborative aspects of the task where pairs create a single product while other respondents thought that it would be better to work individually on the text re-assembly. One respondent pointed out that the activity was dependent on the technology working properly; however in a subsequent overview of the results it was pointed out that dictogloss can work well with paper and pen.

## 5. Conclusions

This short reflective practice paper has pointed the way towards the integration of CRS tools such as *Wooclap* into a practical workshop session. The results suggest that CRS tools can help to ensure a high degree of student engagement and participation in the session.

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# Appendix

## A Dictogloss text

Mount Vesuvius is a volcano in southern Italy. In 79 AD this volcano erupted in one of the deadliest eruptions in European history which was witnessed by the Roman historian and poet Pliny the Younger. The volcano violently spewed forth a deadly cloud of super-heated rock fragments and gases to a height of 33 km. Molten rock and hot ash poured out of the volcano to cover many towns and villages nearby.

Several Roman settlements were destroyed and buried under the massive volcanic flows. The best known of these towns are Pompeii and Herculaneum. The population of both towns was in the region of 16,000 -20,000 at the time of the eruption. The eruption was preceded by a number of earthquakes. The eruption was also accompanied by a tsunami out at sea.

The surges of hot gases and molten lavas covered both cities completely. The ruins of Pompeii were discovered in the late 16th Century. Herculaneum was discovered in 1709, with systematic excavation of the town beginning in 1738. Today these ruined towns are important tourist attractions.

 