

Enhancing personalization and experiential learning in higher education through the VR mobile application, *I'm IN-HKUST*

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Abstract

The present project aims to break the physical limitation of job interview practices for students in LABU2060 Effective Communication in Business, the last required CLE course of the Business School's program at the Hong Kong University of Science and Technology (HKUST). The pandemic has intensified the need for incorporating emerging technologies, e.g., virtual reality (VR), in Higher Education. A VR job interview mobile application was implemented in LABU2060 in 2022. Surveys, field observations and focus group interviews were conducted within HKUST. It was found most students were satisfied with the usability and their learning experience gained through using the application in the 2D mode. Students participated in the field tests, utilizing the application in the VR mode (N=17). The findings revealed that the VR job interview application successfully helped students practice and prepare for their job interviews. Students preferred the VR mode to the 2D mode thanks to the immersiveness and authenticity of the VR job interview practices.

Keywords: *Virtual reality; job interview application; business communication; higher education; personalization; experiential learning.*

1. Introduction

This project was developed to meet the needs of business students in the LABU2060 Effective Communication in Business course, as part of the language requirement for the Business School's program at the Hong Kong University of Science and Technology. The course, beginning with job-seeking, utilizes a simulation approach, but only one online lesson on job interview practices is not sufficient for students. Finding partners to practice outside of class has proved futile (with or without the pandemic), and teachers are unable to provide additional support. To address this, the project team employed Virtual Reality technology as a solution to provide an authentic and immersive learning experience for students. The VR job interview trainer, enhancing learning effectiveness and administrative efficiency (Fabrisa, Rathnera, Fonga, & Sevigny, 2019), was designed to fill the gap in teaching and learning of business communication in a job interview setting. It allows learners to actively engage with the application at their own pace and time without added stress, such as the presence of a teacher or assessments. Through this process, learners are able to reflect on their experience and partake in a meaningful learning process. There are a few online VR training courses for job interview skills in the market. However, these commercial solutions are not without costs. The free job interview software in the market might not be satisfactory while some provide training contradicting what we is taught in our Business Communication course. One existing job interview mobile application in higher education in Hong Kong does not seem to be in full operation due to the limitations presented. Our VR job interview practice application, *I'm IN–HKUST*, in the mobile application market (Play Store and Apple Store) has served to offer comprehensive training for HKUST student users to improve their communication and job interview skills.

2. Literature

The project is based on the principles of experiential learning and the learning model that accounts for how the brain processes and registers information.

2.1. Experiential Learning Theory (ELT)

The creation of meaning is achieved through personal experiences. Kolb's (1984) experiential learning cycle consists of four steps that occur repeatedly during every experience: Experience, Reflect, Think, and Act. The cycle begins with a tandem, a concrete experience followed by reflection on that experience, leading to abstract thinking and deriving conclusions – “learning [is] a function of experience” (Moore 1999, as cited in Moore 2010, p.4). According to ELT (Kolb, 1984; Kolb & Kolb, 2005; Kolb & Kolb, 2009), learning is best facilitated by a process that draws out the students' beliefs and ideas about a topic so that they can be examined, tested and integrated with new, more refined ideas. Furthermore, ELT sees a holistic process as pivotal to learning that involves the integrated

functioning of the whole person, including thinking, feeling, perceiving and behaving. ELT proposes that learning results from synergetic transactions between the learner and the environment. Moreover, ELT views learning as the process of creating knowledge, as opposed to the model which is based on the transmission of prescribed fixed ideas. The experiential learning process is rooted in the process of brain functioning (sensing, integrating and motor) (Zull, 2002). The two sets of experiential learning and brain-based learning principles intersect and are juxtaposed (e.g., Duman, 2010). Learning naturally involves the brain, and learning could be deeper if more parts of the brain are involved.

2.2. Brain-based Teaching and Learning

The Brain-based teaching and learning (BBTL) approach, based on research in cognitive science and neuroscience, aims to align with the brain's natural operations to promote full understanding and memory retention. There are 12 principles established by Caine & Caine (1990) which cover topics such as the brain as a computer, the importance of meaning and experience in learning, which coincide with ELT, and the effects of emotions, attention, and memory. One principle states that people understand and remember best when facts and skills are embedded in natural, spatial memory, i.e., experience, in short. This approach emphasizes a holistic approach to learning and uses the three instructional methods of Orchestrated Immersion (OI), Relaxed Alertness (RA), and Active Processing (AP) to create a highly engaging and meaningful learning experience. The mental model developed through the three instructional techniques (Gülpinar, 2005) is particularly interesting in how BBTL and ELT work together in a learning environment that could maximize the benefits for the learners. Shifting from rote memorization to meaningful learning is essential in BBTL.

3. Project Description

The primary aim of the project was to enhance students' practice opportunities for job interviews and their awareness of their communication skills when answering interview questions. The project objectives were successfully met within the 1.5-year time frame. A VR job interview application with instructional content on job seeking was implemented in a course at HKUST in Spring and Fall 2022 and was made available in the mobile application market. The VR app is linked to a website with a user menu and a database for storing users' performance recordings. The immersive learning experience incorporated virtual reality, personalization, reflective elements, and gamification. Unique features of the project include a VR and 2D mode option, 3 different practice time frames and 3 challenge levels, a collection of job interview questions for a suite of 15 most sought-after jobs among HKUST students, and a replay of interview questions and a skip option during practice sessions. Students can receive verbal feedback from the VR trainer based on their self-assessed performance levels, and training resources, i.e., mini-lessons in the form of videos, are

provided. The mini-lessons feature input from HR directors and managers in the industry as well as instructors of the course.

4. Methodology

Two Qualtrics surveys were conducted in the Fall of 2021 and Spring of 2022 to gather feedback on the VR app. The surveys received positive feedback on the app's usability and the learning experience provided, along with useful suggestions. However, the response rate for both surveys was low, possibly due to the timing of the VR app's launch. Additionally, many respondents used the 2D mode instead of the VR mode, likely because of the pandemic and the difficulty accessing the HKUST library to borrow VR headsets. Hence, the project team invited students from different disciplines to evaluate the project and assess the effectiveness of the VR features in Summer 2022.

HKUST students were invited to partake in a field observation study from 15 June to 16 July 2022. A total of 17 students provided valid responses. The study consisted of three parts: (1) **VR app experience** with short evaluations, where students were asked to use VR goggles provided by the project team and practice an interview in the VR mode, (2) **individual interviews**, and (3) **focus group interviews**. During the field tests, students were given a 15-minute interview practice at a designated difficulty level, but were able to choose any industry and job they were familiar with. After the practice interview, students completed a short self-evaluation on the App and received feedback from the VR app based on their self-evaluation. They were also asked to provide written ratings of their performance and an observer also made notes on their performances. In the final part of the study, students were asked to watch a mini-lesson (out of 13 in total), a 5-10 minute video in the VR mode with any topic of their choosing.

An individual interview was held to gather information about students' experience with the VR app and their engagement during the interview practice. The purpose of the interview was to assess the usefulness and ease of use of the VR app. Afterwards, students participated in a focus group discussion to explore potential uses for the VR app, such as job interview training. The groups were composed of 2-3 students from the same field of study, for example, students enrolled in the LABU2060 class were placed in the same group. The breakdown of participants is listed in Table 1 below.

Table 1: Disciplines of student subjects.

Disciplines	Number of groups	Number of students
Business	4	10
Engineering	2	4
Science	1	3
Total	7	17

5. Findings

The results of the study on the users' experience with the interview practice are presented below, including their level of engagement, level of stress, effectiveness of the VR practices, and effectiveness of the feedback received.

5.1. Level of Engagement

The students' level of engagement during the interview practice was evaluated using a 3-point Likert scale, with results indicating that the students were able to actively participate (average score of 2.29 and a standard deviation of 0.686). The observations made by the teachers also suggest that the students were able to fully engage in the interview practice (average score of 2.47 and a standard deviation of 0.624). These results are presented in Table 2 below. The majority of students were reported to have engaged in the practice and interacted with the VR app. One student was reported to have been initially nervous but eventually became more comfortable as the practice progressed. Students felt more engaged in the VR mode as compared to practising in 2D, as it allowed them to be fully immersed and not distracted by their surroundings.

Table 2: Students' engagement levels as reported by the students and the observers.

Engagement Level	N	Min	Max	Median	Mean	Std. Deviation
Students	17	1	3	2	2.29	0.686
Teacher-observers	17	1	3	3	2.47	0.624

Note: A 3-point Likert scale

5.2. Level of Stress

According to the students' feedback, the majority of them felt low stress levels during the interview practice. They attributed this to app's ability to repeat any questions and the fact that the interviewer was not a real person and would not have any facial expressions affecting their performances. They also highlighted that they felt they were practicing, as the VR interviewer would "go easy on you", and "mistakes are allowed".

5.3. Effectiveness of the VR Practices

The VR interview practice was found to be effective in improving communication and interview skills. The flexibility and convenience of the app, as well as the immersive experience provided by the VR goggles, were cited as factors by students that contributed to its effectiveness. They reported that they were able to engage more fully in the practice and felt more prepared for real job interviews as a result. Additionally, the app provided an authentic experience that was close to a real job interview and helped students focus better and practice more effectively. A student claimed they would "try to use it again, especially

when I'm having a job interview soon. I can listen to some questions from the interviewers. I will be able to practise more and also get more well prepared before the real job interview.” Another student indicated they “would like to try 100% (perform at their best)” in the VR interview. Students reported it was really difficult to have a job interview practice partner in real life. Some students were able to make subsequent improvements based on the self-reflections through the VR app. In contrast, students who had used a 2D version of the app reported being easily distracted and abandoning the practice quickly.

5.4. Effectiveness of the Feedback

To assess the effectiveness of the feedback provided, students were asked to rate their own and teachers the students' performances using the same 3-point scale during the interview practices with the VR app. The results showed that the teachers' ratings were slightly higher than the students' self-evaluations (see Table 3). Related Sample Wilcoxon Signed Rank Test ("Wilcoxon-signed-Rank test," n.d.) was conducted to determine if significant differences between the median scores of the teachers' and students' evaluations were presented. The results showed that there were no significant differences in task fulfillment, fluency, stress and pausing, and energy and enthusiasm level. However, there was a significant difference in the use of language, with the teachers' ratings being higher than the students' self-evaluations, indicating that the students' language use was more proficient than what they reported and the feedback by the VR trainer might have been more critical than what the students should receive in the end.

Students were further asked to provide their thoughts on the feedback they received. The majority of students stated that the feedback provided by the VR app was useful, providing specific and accurate suggestions. One student said the feedback on the VR app was very close to the teacher comments on her job interview performances before.

Table 3: Related Sample Wilcoxon Signed Rank Test on the Observation.

Observer - Students	N	Median		Positive Differences	Negative Differences	p-value (2-tailed)
		Observers	Students			
Task Fulfilment	17	3	2	10	3	0.052
Use of Language	17	2	2	9	2	0.029 [^]
Fluency, Stress and Pausing	17	2	2	6	2	0.132
Energy and Enthusiasm Level	17	2	2	4	3	0.380

Notes: A 3-point Likert scale. [^] Lower than significant level 0.05

6. Discussion

The purpose of the paper was to analyse the findings in regard to the perspective of personalization and experiential learning conceived through the VR app. The results will be analyzed to explore the benefits of using VR technology and self-reflections in learning.

6.1. Personalization through VR Technology

Students' need for more learning practices is often neglected. The VR job interview program is based on the idea of continuous learning which was not feasible in a classroom setting due to administrative and resource concerns and the curriculum design. It is not up to the students if they hope to have practices on a given topic in the capacity and frequency each individual would prefer to have. In reality, solely one lesson was assigned for students to practice the communication skills they have acquired in teachers' preferred format (in pairs or groups) in class. The students in the study found that repeating the same tasks in the VR environment helped them improve their responses, and they felt that this repetition helped them answer job interview questions in a more organized way. In addition, the communication skills they developed would be pivotal not only to the job interview assessments that will shortly be conducted but also to real-life job or internship interviews that might occur at a much later time. With the VR app, job interview practices are personalized – it has become a viable option according to the time and space as needed by students.

6.2. Experiential Learning through VR Technology

The main focus of the study is to understand the effectiveness of using a virtual reality (VR) job interview speaking program, in the form of a mobile application. The research specifically examines the experiences of the student users and the benefits of using VR technology for this type of communication skills training (see Table 2). The results suggest that students preferred the VR mode as it provides an authentic, immersive and interactive

experience, which leads to better performance during the interview. The VR environment creates a sense of presence and eliminates distractions, contributing to the overall effectiveness of the program. All of these coincide with the intended pedagogy behind the program which is based on Experiential Learning Theory and Brain-based Teaching and Learning, focusing on the “integrated functioning of the whole person—thinking, feeling, perceiving, and behaving.” Student users are engaged in a learning environment that fully engages their many communication skills (OI), allowing them to process learning materials by actively practicing them (AP) while removing the unnecessary fear (RA). The VR job interview application aims to provide a safe and secure learning environment that promotes meaning-making and counters ‘downshifting’ (when learners retreat to a defensive mode being less flexible and open to new information). The study's findings indicate that the VR app is a superior platform for experiential learning, which was not initially expected by the researcher.

7. Conclusion

The VR job interview training environment creates a sense of presence, eliminates distractions, and contributes to the overall effectiveness of the program. The VR app was designed in a manner to allow students to reflect on their own learning and take charge of their own development by providing personalized options (in terms of the length of practices, challenge levels, industry and job, replaying or skipping any interview questions during the practice) and flexibility (with reference to time and space), in line with the principles of experiential learning theory (ELT). ELT posits that learning is most effective when it is an active process, where students learn by doing and reflecting on their experiences. The study's findings support the effectiveness of using VR technology for communication skills training, yielding the benefits of personalization and meaningful learning experience.

References

- Caine, R. N., & Caine, G. (1990). Understanding a Brain-Based Approach to Learning and Teaching. *Educational leadership*, 48(2).
https://www.uvm.edu/~mjk/013%20Intro%20to%20Wildlife%20Tracking/Brain-Based_Learning.pdf
- Duman, B. (2010). The Effects of Brain-Based Learning on the Academic Achievement of Students with Different Learning Styles. *Educational Sciences: Theory and Practice*, 10(4).
- Fabrisa, C. P., Rathnera, J. A., Fonga, A. Y., & Sevigny, C. P. (2019). Virtual Reality in Higher Education. *International Journal of Innovation in Science and Mathematics Education*, 27(8), 69-80. file:///C:/Users/WIN/Downloads/13983-85-40497-2-10-20191022.pdf

- Gülpinar, M. A. (2005). The Principles of Brain-Based Learning and Constructivist Models in Education. *Educational Sciences: Theory & Practice*, 5(2).
- Kolb, D. A. (1984). *Experiential Learning: Experience as the Source of Learning and Development*. New Jersey: Prentice-Hall.
- Kolb, A. Y., & Kolb, D. A. (2005). Learning styles and learning spaces: Enhancing experiential learning in higher education. *Academy of Management Learning & Education*, 4(2), 193-212. <https://doi.org/10.5465/amle.2005.17268566>
- Kolb, A. Y., & Kolb, D. A. (2009). Experiential learning theory: A dynamic, holistic approach to management learning, education and development. *The SAGE Handbook of Management Learning, Education and Development*, 42-68. <https://doi.org/10.4135/9780857021038.n3>
- Moore, D. T. (2010). Forms and issues in experiential learning. In D. M. Qualters (Ed.) *New Directions for Teaching and Learning* (pp. 3-13). New York City, NY: Wiley.
- Wilcoxon-signed-Rank test*. (n.d.). SpringerLink. https://link.springer.com/referenceworkentry/10.1007/978-3-642-04898-2_616
- Zull, J. E. (2002). *The Art of Changing the Brain*. Sterling, VA: Stylus.