

Using generative AI tools and LARA to create multimodal language learning resources for L2 Icelandic

Annika Simonsen^a and Branislav Bédi^b

^aUniversity of Iceland, , ans72@hi.is and ^bÁrni Magnússon Institute for Icelandic Studies, , branislav.bedi@arnastofnun.is

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Abstract

We utilize ChatGPT and other generative AI tools in developing illustrated multimodal resources for learning Icelandic as a second language (L2) via reading in the online platform LARA. These are illustrated short stories in Icelandic created using specific prompts including information about learner levels and age groups. We present a methodology for creating engaging stories and a way to evaluate the quality and suitability of text and images generated by AI. Additionally, we assess how 46 adult learners perceived reading a story at A1 and A2 level in LARA, with a positive vocabulary learning effect. We conclude that generating suitable prompts greatly assists with getting the desired output; however, this is restricted to the language one works with. Much human post-editing is still necessary for Icelandic texts to improve their quality in grammar, vocabulary, and cultural aspects, and their suitability for language teaching.

Keywords: *generative artificial intelligence, ChatGPT, prompt engineering, Icelandic L2, language education, reading.*

1. Introduction

Current generative Artificial Intelligence (AI) tools assist with rapid and relatively reliable ways of generating text and images. Despite the significant strength of ChatGPT-4 in generating language content for English, its capability is currently limited when it comes to less commonly spoken languages (Chang et al., 2023) including Icelandic. Our aim is to find out whether ChatGPT-4 can be used to generate text suitable for language teaching, post-reading exercises, and illustrations to assist L2 Icelandic learners with enhancing their reading comprehension skills. Using ChatGPT-4 to create educational resources for less resourced languages such as Icelandic can be time and cost efficient. Here, we focus on creating multimodal resources, specifically reading texts suitable for language teaching, post-reading exercises, and illustrations to assist L2 Icelandic learners with enhancing their reading skills. These resources will be presented in a multimodal fashion in the LARA (Learning And Reading Assistant) platform, which enables recordings of individual words and text segments through the Text-To-Speech (TTS) technology of Google and presenting translation of words into English (in our case) and a concordance page with references to frequency and alphabetical lists.

Through ChatGPT-4's Natural Language Processing (NLP) capabilities, we aim to provide L2 learners of Icelandic with an engaging language learning environment. To achieve this, the content must be multimodal and educational (Dressmann, 2019), i.e. combining various senses including reading, listening, illustrations, and

exercises. We utilize different AI system for creating text (ChatGPT-4) and images (DALL-E-2¹, Midjourney² and Stable Diffusion³), and the LARA platform for integrating the illustrated reading texts.

We present results from an anonymous online survey, which was conducted about reading perception. Responses from 46 adult L2 Icelandic learners from fourteen different countries with age range 18-64 years, at beginner (A1) to intermediate (A2) levels, were obtained. The following section will describe the method for generating text and images. The results are discussed in the final section.

2. Method

Constructing effective prompts is crucial in getting relevant responses from ChatGPT (Kohnke et al., 2023). We developed specific prompts that helped create desired content. The ChatGPT capabilities enabled creating lemmatised versions of texts with translations into English and short stories for different learner levels based on the Common European Framework of Reference for Languages (CEFR).⁴ This was done thanks to ChatGPT-4's capability to align texts with the CEFR framework as well as manually incorporating this information into our prompts. These texts were furthermore aligned with the corresponding overview of reading comprehension guidelines (Piccardo, 2020) for age groups (pupils in primary schools, students in secondary schools, and adults in colleges). Texts and images were subsequently transformed into multimodal resources in the online platform LARA (Akhlaghi et al., 2019).

Additionally, inspired by Eldan & Li (2023), who created a synthetic dataset of English short stories *TinyStories* generated by GPT-3.5 and GPT-4 that contain only words that three to four year olds would understand, we used only part 1 and 3 of the following framework: 1) a list of words to be included in the story, 2) a sentence that should appear somewhere in the story, 3) a list of features (possible features: dialogue, bad ending, moral value, plot twist, foreshadowing, conflict), and 4) a short summary (one to two lines) of the story. The authors used GPT-4 to evaluate its own stories by asking to act as a teacher and grade the stories as if they were written by a student. Our prompts were generated in two languages, English and Icelandic, to test the ChatGPT capability in generating the same content using two different languages.

2.1. Generating texts and exercises

Following the OpenAI guidelines⁵ for generating prompts, we focused on parameters that would be specifically relevant to teachers of L2 Icelandic. We manually incorporated information about CEFR, the reading comprehension guidelines (Piccardo, 2020), into our prompts, and specified whether the readers are children or adults. Additionally, we requested ChatGPT to provide multiple-choice questions for the stories based on the difficulty level of the target learner audience. We also provided a list of specific words that needed to be included in the stories to simulate teachers' purpose to possibly teach specific words in their class. Finally, we tried writing prompts in both English and Icelandic, both resulting in similar content. After ChatGPT had generated the stories from the prompts, they were proofread by human native speakers. Firstly, by a teacher of L2 Icelandic for adults, who proofread fifteen stories (see Appendix A for the prompts used to create the stories). The stories included content which was often not suitable to the cultural setting of Iceland, such as restaurant staff calling restaurant guests by their first names. Secondly, selected stories were revised by additional human evaluators to reflect a real-world Icelandic cultural setting (e.g. adjusting the names of persons and places, plot points in the local setting, and the description of places to create a more authentic sounding environment). Through the editing phase, some aspects of the story, such as the vocabulary, setting, and cultural context were changed to make sense of the plot in the story.

¹ <https://openai.com/dall-e-2>

² <https://www.midjourney.com>

³ <https://stablediffusionweb.com>

⁴ <https://www.coe.int/en/web/common-european-framework-reference-languages/table-1-cefr-3.3-common-reference-levels-global-scale>

⁵ <https://platform.openai.com/docs/guides/gpt-best-practices>

Table 1. Overview of the experimental setup and parameters based on 15 stories (see Appendix B for costs associated with generating stories with ChatGPT-4).

Experimental setup	Parameters
Stories without any given subject	Length: 250 words Learner level: adult beginner
Stories with a given subject	Topic: “Write a short anecdotal story in Icelandic about buying an ice cream in Reykjavík”
Stories with different CEFR levels	CEFR Levels: A1, A2, B1, B2, C1, C2
Stories for children	Age: 3-5, 6-7, 8-10, 11-13, 14-17 years old
Stories with specific features and words	Feature list (e.g. “plot twist, dialogue, hero”) and word list (e.g. “cat”, “sitting”, “happy”)
Icelandic prompts	Prompt language: Icelandic
Creation of multiple-choice questions	Output type: multiple choice questions
Self-evaluation of stories	Role: Teacher evaluation
Grammatical proofreading by native speaker	Role: Native Icelandic speaker, L2 teacher
Real-world revisions	Revisions: Names, places, plot points

For regarding exercises, we specified the number of items in multiple choice questions, the learner level, and that they had to be written in Icelandic and include correct answers.

2.2. Generating images

We used DALL-E 2, Midjourney, Stable Diffusion’s demo version on HuggingFace⁶, and DreamStudio⁷ to generate images to illustrate the stories. Prompts were written by both the human content creator and ChatGPT-4. The most successful results were obtained by showing ChatGPT-4 a prompt guide⁸ written by the developers of Stable Diffusion and asking it to write an illustration creation prompt for a specific story. This prompt was then used to generate an image with either DALL-E 2, Midjourney, or Stable Diffusion. The results varied, and it quickly became evident that the different AI systems require different amounts of detail in their prompts. In the end, one image was chosen from the selection provided by very different tools and art styles (compare Figure 1, 2, and 3).

⁶ <https://huggingface.co/spaces/stabilityai/stable-diffusion>

⁷ <https://beta.dreamstudio.ai/generate>

⁸ <https://stable-diffusion-art.com/prompt-guide/>

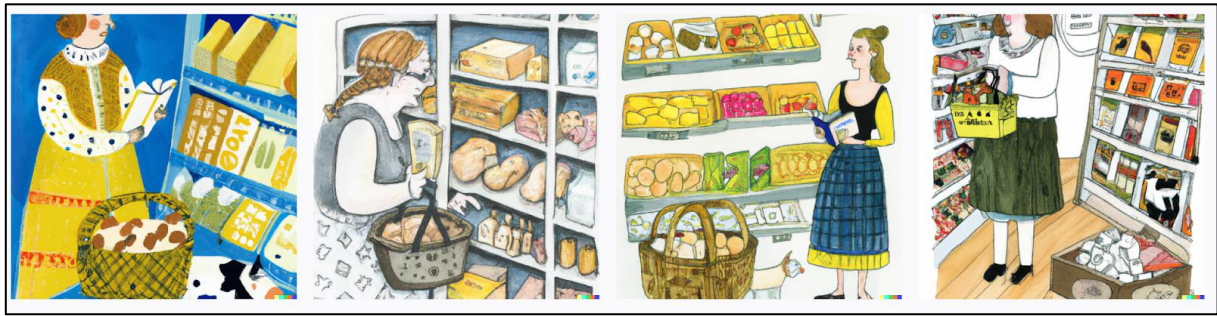


Figure 1. Illustration generated by DALL-E 2 using prompt, “A whimsical book illustration of a woman shopping in an Icelandic grocery store with a shopping basket containing potatoes, meat, and cheese. She's looking at the milk section, preparing to select the next item”.



Figure 2. Illustration generated by Stable Diffusion using prompt, “A book illustration of a woman shopping in an Icelandic grocery store with a shopping basket containing potatoes, meat, and cheese”.

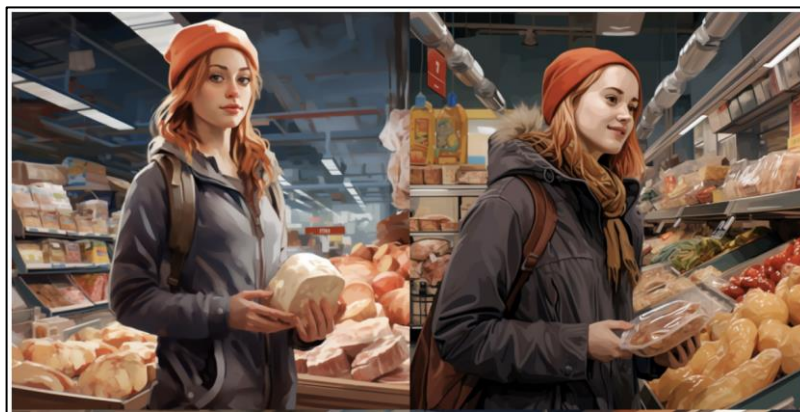


Figure 3. Illustration generated by Midjourney using prompt, “Digital painting of a woman named Hildur shopping in an Icelandic grocery store. She is holding a shopping basket filled with potatoes, meat, and cheese. In front of her is the milk section, which she is carefully considering. The scene is vibrant and detailed, in the style of a contemporary Icelandic artist”.

3. Assessing the reading experience of L2 Icelandic learners


Two out of 15 illustrated short stories (one at A1⁹ and one at A2¹⁰ level) were selected for evaluation by 46 adult L2 Icelandic learners from 14 different countries with age 18-64 years, either at beginner to below intermediate (26 learners at A1 level) or intermediate (20 learners at A2 level). An anonymous online survey was made using Google Forms with 21 multiple choice, closed and open-ended questions about the story, learning experience, perception of AI presence, and demographics¹¹, and distributed on social media and by email in an ongoing summer language course. Link to the online version of the two stories in LARA was provided (see example in Figure 4).

Ísbúð í Reykjavík

Ég heiti John og ég bý í Reykjavík. Einn heitan sumardag var mér mjög heitt þá ákvað ég að kaupa ís.

Ég gekk í ísbúð í miðbænum. Ég sagði: "Ég ætla að fá einn ís, takk." Konan bak við búðarborðið spurði: "Hvaða bragð viltu?" Ég vissi ekki hvaða bragð ég vildi. Í búðinni voru margar tegundir af ís. Ég sagði: "Mig langar að smakka súkkulaðísinn, takk." Konan gaf mér smá súkkulaðís á skeið til að smakka. Hann var mjög góður! Ég sagði: "Ég ætla að fá súkkulaðísinn, takk." Hún rétti mér stóran ís með súkkulaðibragði. Ég settist niður fyrir utan í sólinni og naut íssins. Ég sagði við sjálfan mig: "Það er gott að vera í Reykjavík!"

Þetta var frábær dagur. Ég mun aldrei gleyma þessum degi þegar ég keypti fyrsta ísinn minn í Reykjavík.



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- ← Ég heiti John og ég bý í Reykjavík.
- ← Einn heitan sumardag var mér mjög heitt þá ákvað ég að kaupa ís.
- ← Ég gekk í ísbúð í miðbænum.
- ← Ég sagði: "Ég ætla að fá einn ís, takk."
- ← Ég vissi ekki hvaða bragð ég vildi.
- ← Ég sagði: "Mig langar að smakka súkkulaðísinn, takk."
- ← Ég settist niður fyrir utan í sólinni og naut íssins.
- ← Ég sagði við sjálfan mig: "Það er gott að vera í Reykjavík!"
- ← Ég mun aldrei gleyma þessum degi þegar ég keypti fyrsta ísinn minn í Reykjavík.

Notes

Frequency index

Alphabetical index

Figure 4. The A1 story shared with participants on the online platform LARA, with illustration created by Midjourney (right) and concordance page (left).

4. Results and discussion

The results indicate a practical benefit in using generative AI tools for creating unique content suitable for language learning at different learner levels and age groups. ChatGPT-4, however, still makes many grammatical errors in Icelandic and the prompts need to include specific instructions about the desired length of texts. Human post-editing is the most time-consuming part (ca. 25 minutes per story). By comparison, the grammatical Word Error Rate (WER) in our stories was relatively high (22-25%), likely due to the fact that the proofreader was a teacher and was asked to make the text suitable for language learning. The other two proofreaders did not receive such instructions and their WER was lower (12.80-20%). The WER does not include cultural and contextual inconsistencies.

ChatGPT-4 is, nonetheless, able to correct some of its own grammatical errors in Icelandic, e.g. grammatical gender and tense, but not consistently enough (see Appendix C). Although ChatGPT-4 seems less capable of correcting nonsensical words and phrasing, it can produce different styles based on learner age, e.g. a story about a woman going grocery shopping includes the incorrect term in Icelandic *húðflúrsfylling* (tattoo-filling) instead of *smjördeigsfylling* (puff-pastry filling). Stories can also contain peculiarities, e.g. a tourist from New York visiting Iceland named *Ólafur* (typical Icelandic name) instead of having a typical US name, or a man buying an

⁹ https://www.issco.unige.ch/en/research/projects/collector/1044_Ísbúð_í_Reykjavík/vocabpages/hyperlinked_text.html

¹⁰ https://www.issco.unige.ch/en/research/projects/collector/1040_Daniel_frá_Winnipeg/vocabpages/hyperlinked_text.html

¹¹ <https://github.com/BranBedi/ChatGPT-LARA/blob/ea7524f8417dfc4d2f28563746f6c00453def08c/Questionnaire%20for%20A1%20and%20A2%20stories%20in%20LARA.pdf>

ice cream (not a drink) because of being thirsty. Human editors need to add more cultural aspects, e.g. description of town architecture, interior of typical cafés, or appropriate phrases for ordering a coffee. These would make the stories more engaging. We observed that ChatGPT-4 does indeed have the capability of adding jokes to stories but, at this stage, it would more often than not make nonsensical or inappropriate jokes in Icelandic.

For adult learners, ChatGPT-4 typically created stories about people of foreign origin living in Iceland and learning Icelandic in different settings. For children learners, the typical story would involve children or heroic animals. To get more variety in the plots, using Eldan & Li's (2023) framework was helpful. Reading guidelines and the CEFR reference helped ChatGPT-4 to make the story adjusted to the learner level.

To generate images, we recommend to show ChatGPT a prompt guide¹² and ask it to write a prompt for an image in each story. Various generative AI tools can help create different illustrations that are suitable for different styles and reader audience, and/or personal taste of the content creator.

For exercises, ChatGPT-4 is good in creating simple and effective multiple choice questions. If specified, it can also generate answers that can be proofread by the content creators themselves.

In the online survey, L2 Icelandic learners of both reading groups, A1 and A2 stories, reported high reading comprehension, 32 out of 46 (70%) reported learning new vocabulary (one or more new words)¹³ from the stories, but commented that they could have appreciated more engaging content and more cultural representation of Iceland, e.g. eating ice cream during winter instead of summer. Suggestions for future iterations included enhancing the user experience by creating more content similar to the stories used here, however, focusing on detailed, culturally-rich narratives to facilitate a more immersive learning experience, and improving compatibility with reading these texts on mobile devices. When asked how likely it was that the story had been generated by AI, the A1 reading group showed slightly more belief in this idea. This might be because the A2 story went through more post-editing process by a human.

By combining the capabilities of AI with human expertise during the post-editing stage, our goal is to attain a balance between efficiency and ethical content creation.

5. Conclusions

In conclusion, the ChatGPT-4 shows promising potential for generating text suitable for L2 Icelandic learners to help enhance reading skills. However, human expertise is necessary during post-editing to include cultural accuracy. ChatGPT-4 still makes many grammatical and lexical errors when generating text in Icelandic and lacks local cultural knowledge to give it appropriate setting and language context because narratives need to be both linguistically accurate and culturally resonant. Future endeavors should also focus on enriching the stories with cultural information and possibly amusing content to foster a more immersive learning experience.

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¹² <https://stable-diffusion-art.com/prompt-guide/>

¹³ The English translations on the LARA platform do not work on smartphones, so several survey respondents were unable to access them.

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Appendices

Appendix A

List of prompts

1. A1-level short story with a topic provided

- a) You are a teacher teaching Icelandic as a second language to adults. Write a short anecdotal story (approximately 250 words) in Icelandic about buying an ice cream in Reykjavík. Make sure the text is appropriate for an adult L2 learner of Icelandic who is a beginner.
- b) Excellent. Now change the text, so that it is appropriate for an adult L2 learner of Icelandic who is intermediate.
- c) Excellent. Now change the text, so that it is appropriate for an adult L2 learner of Icelandic who is advanced/master.

2. A2-level short story without a topic provided

- a) You are a teacher teaching Icelandic as a second language to adults. Write a short anecdotal story (approximately 250 words) in Icelandic. Make sure the text is appropriate for an adult L2 learner of Icelandic who is a beginner.
- b) Excellent. Now change the text, so that it is appropriate for an adult L2 learner of Icelandic who is intermediate.
- c) Excellent. Now change the text, so that it is appropriate for an adult L2 learner of Icelandic who is advanced/master.

- d) Thank you. What is the difference between the first, second and third story you made in terms of difficulty?

3. Showing ChatGPT the overall reading comprehension guidelines from CEFR

- a) This is an overview of Overall reading comprehension from the Common European Framework for Languages. A1-A2 is beginners, B1-B2 is for intermediates and C1-C2 is for advanced.

C2: Can understand virtually all forms of the written language including abstract, structurally complex, or highly colloquial literary and non-literary writings. Can understand a wide range of long and complex texts, appreciating subtle distinctions of style and implicit as well as explicit meaning.

C1: Can understand in detail lengthy, complex texts, whether or not they relate to his/her own area of speciality, provided he/she can reread difficult sections. Can understand a wide variety of texts including literary writings, newspaper or magazine articles, and specialised academic or professional publications, provided that there are opportunities for re-reading and he/she has access to reference tools.

B2: Can read with a large degree of independence, adapting style and speed of reading to different texts and purposes, and using appropriate reference sources selectively. Has a broad active reading vocabulary, but may experience some difficulty with low-frequency idioms.

B1: Can read straightforward factual texts on subjects related to his/her field and interests with a satisfactory level of comprehension.

A2: Can understand short, simple texts on familiar matters of a concrete type which consist of high frequency everyday or job-related language. Can understand short, simple texts containing the highest frequency vocabulary, including a proportion of shared international vocabulary items.

A1: Can understand very short, simple texts a single phrase at a time, picking up familiar names, words and basic phrases and rereading as required.

Pre-A1 Can recognise familiar words accompanied such as a fast-food restaurant menu illustrated with photos or a picture book using familiar vocabulary.

You are a teacher teaching Icelandic as a second language to adults. Write a short anecdotal story (approximately 250 words) in Icelandic. Make sure the text is appropriate for an adult L2 learner of Icelandic who is level A1 or A2 according to the Common European Framework for Languages.

- b) Great. Now change the story so it's appropriate for an adult L2 learner at level B1 to B2.

- c) Great. Now change the story so it's appropriate for an adult L2 learner at level C1 to C2.

- d) Thank you. Could you tell me what the difference is between the three stories in terms of difficulty?

Making multiple choice questions with ChatGPT

- e) Could you make five multiple choice questions for the first story? They should be appropriate for adult L2 learners at level A1 to A2.
- f) And could you now make five multiple choice questions for the second story? They should be appropriate for adult L2 learners at level B1 to B2.
- g) And could you now make five multiple choice questions for the third story? They should be appropriate for adult L2 learners at level C1 to C2.
- h) Could you give the answers to all of the multiple-choice questions you just made?

4. Showing ChatGPT-4 examples of LARA stories before asking for a story

- a) LARA (Learning and Reading Assistant) is a collaborative open-source project, active since mid-2018, whose goal is to develop tools that support conversion of plain texts into an interactive multimedia form designed to support development of L2 language skills by reading. The basic approach is in line with Krashen's influential Theory of Input, suggesting that language learning proceeds most successfully when learners are presented with interesting and comprehensible L2 material in a low-anxiety situation.

Here are a few examples of LARA stories created by ChatGPT:

Dutch

Oma wint skateboardwedstrijd in Nederlands dorp In het kleine Nederlandse dorpje Rolbord, heeft een 75-jarige oma, genaamd Jannie, iedereen verbaasd door de lokale skateboardwedstrijd te winnen. Jannie, een voormalig gymnastieklerares, heeft laten zien dat leeftijd slechts een getal is en dat je nooit te oud bent om te leren en plezier te hebben.

Jannie, die pas een jaar geleden begon met skateboarden, had al snel de aandacht getrokken van de dorpsbewoners. Ze oefende dagelijks in het lokale skatepark, waar ze nieuwe trucjes leerde en vriendschappen sloot met jongeren uit het dorp. Haar doorzettingsvermogen en enthousiasme waren aanstekelijk, en haar populariteit groeide snel.

Toen de jaarlijkse skateboardwedstrijd naderde, besloot Jannie zich in te schrijven en deel te nemen. Hoewel sommigen twijfelden aan haar vermogen om te concurreren met de jongere deelnemers, was Jannie vastberaden om iedereen te bewijzen dat ze het kon.

Op de dag van de wedstrijd wist Jannie het publiek te verbazen met haar indrukwekkende vaardigheden en behendigheid op het skateboard. Ze voerde ingewikkelde trucjes uit, zoals de "ollie" en de "kickflip", en won uiteindelijk de eerste prijs.

De winst van Jannie heeft niet alleen geleid tot veel felicitaties van de dorpsbewoners, maar heeft ook de aandacht getrokken van nationale en internationale media. Haar verhaal heeft velen geïnspireerd en laten zien dat het nooit te laat is om nieuwe uitdagingen aan te gaan.

Nu haar overwinning bekend is geworden, heeft Jannie plannen om haar vaardigheden verder te ontwikkelen en zelfs skateboardinglessen te geven aan andere senioren in Rolbord. Zo hoopt ze anderen te inspireren om uit hun comfortzone te stappen en het beste uit zichzelf te halen, ongeacht hun leeftijd.

Icelandic:

Páfagaukur reddar tónleikum Reykjavík

– Í gær kvöld voru tónleikar á skemmtistaðnum Hljóðbylgja, þar sem hljómsveitin Fjallabljót tók áhorfendur á óvart með óvæntan gest. Á meðal laganna sem þeir fluttu var páfagaukur, sem hafði skellt sér inn í tónleikasalinn. Áhorfendur voru fyrst undrandi en brátt fylgdust þeir með áhuga. Páfagaukurinn flaug um salinn, skellti sér upp á svið og fylgdi takti tónlistarinnar með blíðu hávaða. Hljómsveitin tók þetta með jólum og spilaði saman við fuglinn. Áhorfendur klappuðu og öskruðu þegar tónleikarnir laukust, en það var engin vafi um að páfagaukurinn hefði stolið sýninguna. Eftir tónleikana var fuglinum fylgt út, en hann hélt áfram að syngja með Fjallabljótum, sem stóðu þar úti og sungu nokkur lög að skemmti fólks. Þessi sérstaki tónleikakvöld munu vafalaust verða mikið rædd í komandi dögum, og páfagaukurinn hefur nú orðið algjör staðarfrægur.

Italian:

Un gatto diventa il sindaco di un piccolo paese italiano In un piccolo paese italiano chiamato Gattopoli, i cittadini hanno votato a sorpresa un gatto di nome Fuffi come il loro nuovo sindaco. Sembra che Fuffi, un felino molto amato nella comunità, abbia conquistato i cuori degli abitanti grazie al suo fascino e alla sua presenza costante nella piazza del paese.

Fuffi, un gatto nero con una macchia bianca sul petto, è noto per aver aiutato a risolvere piccoli problemi tra i cittadini e per aver tenuto lontani i piccioni dal centro storico. Anche se il suo curriculum politico potrebbe sembrare limitato, i cittadini di Gattopoli hanno deciso di affidargli la guida del paese.

Durante la campagna elettorale, Fuffi ha ricevuto il sostegno di molti residenti, che hanno creato cartelloni e slogan per promuovere il loro candidato felino. "Fuffi per un Gattopoli migliore" e "Una zampa avanti con Fuffi" sono solo alcuni degli slogan che hanno riempito le strade del paese.

Il risultato delle elezioni ha attirato l'attenzione dei media internazionali, che sono accorsi a Gattopoli per intervistare Fuffi e i suoi sostenitori. Il vice sindaco, Luigi Rossi, ha assicurato che Fuffi sarà affiancato da un team di esperti umani che lo aiuteranno a prendere decisioni importanti per il bene del paese.

Nonostante le ovvie difficoltà pratiche, i cittadini di Gattopoli sono entusiasti della loro scelta e sperano che Fuffi porti un'atmosfera di armonia e collaborazione nel paese. Dopotutto, come dicono gli abitanti del posto, "Fuffi sa come mettere d'accordo tutti".

You are a teacher teaching Icelandic as a second language to adults. Write a short anecdotal story (approximately 250 words) in Icelandic that is in the style of the examples shown before. Make sure the text is appropriate for an adult L2 learner of Icelandic who is a beginner.

Asking for CEFR-related changes

- b) Change the story so that it's more in line with the reading comprehension guidelines from The Common European Framework of Reference for Languages for beginners levels A1 and A2.

A2: Can understand short, simple texts on familiar matters of a concrete type which consist of high frequency everyday or job-related language. Can understand short, simple texts containing the highest frequency vocabulary, including a proportion of shared international vocabulary items.

A1: Can understand very short, simple texts a single phrase at a time, picking up familiar names, words and basic phrases and rereading as required.

Asking ChatGPT to stay within the word limit

- c) Make sure the stories are about 250 words long while still being in line with the reading comprehension guidelines from The Common European Framework of Reference for Languages for beginners levels A1 and A2.

5. Asking for a story for children by providing ages

- a) You are a teacher teaching Icelandic as a second language to children. Write a short anecdotal story (approximately 250 words) in Icelandic that is in the style of the examples shown before. Make sure the text is appropriate for a child L2 learner of Icelandic who is between 3-5 years old.
- b) Excellent, now make a story that is appropriate for an child L2 learner of Icelandic who is between 6-7 years old.
- c) Excellent, now make a story that is appropriate for an child L2 learner of Icelandic who is between 8-10 years old.
- d) Excellent, now make a story that is appropriate for an child L2 learner of Icelandic who is between 11-13 years old.
- e) Excellent, now make a story that is appropriate for an child L2 learner of Icelandic who is between 14-17 years old.
- f) Thank you. Could you tell me what the difference is between the three stories in terms of difficulty?

6. Asking for a story for children by providing CEFR levels

- a) You are a teacher teaching Icelandic as a second language to children. Write a short anecdotal story (approximately 250 words) in Icelandic that is in the style of the examples shown before. Make sure the text is appropriate for a child L2 learner of Icelandic who is level A1.
- b) Excellent, now make a story that is appropriate for a child L2 learner of Icelandic who is level A2.
- c) Excellent, now make a story that is appropriate for a child L2 learner of Icelandic who is level B1.
- d) Excellent, now make a story that is appropriate for a child L2 learner of Icelandic who is level B2.
- e) Excellent, now make a story that is appropriate for a child L2 learner of Icelandic who is level C1.

- f) Excellent, now make a story that is appropriate for a child L2 learner of Icelandic who is level C2.
- g) Thank you. Could you tell me what the difference is between the three stories in terms of difficulty?

7. Asking for a story featuring specific words and features (inspired by Eldan and Li (2023)).

- a) You are a teacher teaching Icelandic as a second language to adults. Write a short anecdotal story (approximately 250 words) in Icelandic. The story should include the following features: plot twist, dialogue, hero, and the words “cat”, “sitting” and “happy”. Make sure the text is appropriate for an adult L2 learner of Icelandic who is a beginner.

8. Following Eldan and Li (2023)’s framework for evaluating stories

- a) Complete the Icelandic story following the symbol ***.
- b) You are a teacher teaching adults Icelandic as a second language. In the following exercise, the student is given a beginning of a story. The student needs to complete it into a full story. The exercise tests the student’s language abilities and creativity. The symbol *** marks the separator between the prescribed beginning and the student’s completion:

Einu sinni, í fornri húsnæði, bjó stúlka sem hét Lily. Hún elskaði að skreyta herbergið sitt með fögrum hlutum. Eitt kvöld fann hún stóran kassa á vindinum. Hún opnaði hann og sá marga glitrandi skreytingar. Lily var mjög glöð og ákveðaði að nota þær í herberginu sínu. Þegar Lily var að skreyta herbergið sitt, myrkvaði loftið út um gluggana. Það var hávaðasamur*** stormur sem hófst, og vindurinn blés kaldan andanum inn í herbergið. Þrátt fyrir það, held Lily áfram að skreyta. Hún var mjög einbeitt og lét enga óróleika trufla sig. Hun hengdi glitrandi skreytingarnar um allt í herberginu. Þær skínu sem stjörnur í myrkri. Þegar hún var loks búin að skreyta allt, sat hún niður og horfði á verk sitt. Það var eins og að horfa upp í stjörnuþökuna, hver skreyting var sem stjarna sem skín í nóttinni. Skyndilega, í miðri storminum, heyrði hún banka á dyrnar. Hún stóð upp og fór að opna. Þar stóð maður með grátt hár og skyggndist inn í herbergið. Hann brosti þegar hann sá hvernig Lily hafði skreytt herbergið. "Það er fallett, Lily," sagði hann. "Þú hefur skapað þitt eigið alheimur hér inní." Stormurinn lagðist smám saman og maðurinn fór aftur út í nóttina. Lily horfði eftir honum og brosti. Hún vissi að hún hafði skapað eitthvað sérstakt. Herbergi hennar var ekki bara herbergi lengur, það var alheimur fullur af stjörnum. Og það var allt saman takk sé einum glitrandi skreytingum sem hún hafði fundið í kassanum á vindinum.

- c) Please provide your general assessment about the part written by the student (the one after the *** symbol). Is it grammatically correct? Is it consistent with the beginning of the story? Pay special attention to whether the student manages to complete the sentence which is split in the middle by the separator ***.
- d) Now, grade the student’s completion in terms of grammar, creativity, consistency with the story’s beginning and whether the plot makes sense.

9. Asking ChatGPT to write a prompt for DALL-E 2, Midjourney and Stable Diffusion.

- a) Make a DALL-E 2 text prompt for the first story you made.
- b) Make a Midjourney text prompt for the first story you made.
- c) Make a Stable Diffusion text prompt for the first story you made.

- d) Here is a prompt guide from Stable Diffusion. Read it and make a prompt for the first story you made. [prompt guide inserted]

Appendix B

Overview over basic requirements to follow our methodology.

Step	Requirement	Cost	Notes
1	Subscription to ChatGPTplus	\$20 per month	The alternative is to apply for API access for GPT-4. With API-access to GPT-4, you can use the playground to generate texts using system prompting. The user is charged for input and output tokens.
2	Formulating prompt	N/A	ChatGPT-4 will always recommend that the user writes the prompt in English, but it is also possible to write it in Icelandic.
3	A native speaker to correct the output	Variable	If the user is not a native speaker, then the cost will depend on the specific rates of the native speaker that they hire.
4	Registration with DALL-E 2, Midjourney, or Stable Diffusion	\$15 per 115 prompts for DALL-E 2 tokens or \$10 per month for Midjourney subscription	DALL-E 2 users from before April 6th 2023 get free credits. Stable Diffusion is free, but requires a good computer and IT knowledge for the best result. Midjourney requires a Discord account.

Appendix C

This appendix contains an example that shows the difference between using a professional proof-reader to proofread an Icelandic story generated by ChatGPT-4 (figure 5) and using ChatGPT-4 to proofread its own story (figure 6). The professional proof-reader is a native speaker of Icelandic, who teaches L2 Icelandic to adults. She was told to proofread the text, so it was appropriate as teaching material for L2 speakers of Icelandic. ChatGPT-4 was asked to proofread its own story in a new window and was told it was a story written by a student. Additionally, we show two examples of two additional native speakers of Icelandic, who are not teachers, correcting the same text (figure 7 and 9). These proof-readers were not told that this text was meant as teaching material for L2 speakers before proofreading.

Story 1:

A1

Ég heiti John og ég bý í Reykjavík. ~~Einn~~ sumardag var ég mjög heitur. Ég ákvað ~~Ég~~ **Einn heitan sumardag ákvað ég** að kaupa ís.

Ég gekk ~~til ísbúðar sem er~~ ísbúð í miðbænum. Ég sagði: "Ég ~~vil~~ **ætla** að fá einn ís, takk." Konan ~~að bakibak við búðarborðsins~~ búðarborðið spurði: "Hvaða bragð viltu?" Ég vissi ekki hvaða bragð ég vildi. Í búðinni voru margar tegundir ~~íss~~ **af ís**. Ég sagði: "Ég ~~vil~~ **smakka sjokólaðis**." Mig langar að smakka súkkulaðið **sinn**, takk."

Konan gaf mér smá ~~sjokólaðis~~ **súkkulaði** á skeið ~~til að smakka~~. ~~Það var mjög gott~~ **Hann** var mjög **góður!** Ég sagði: "Ég ~~tek~~ **sjokólaðis** ætla að fá súkkulaðið **sinn**, takk." Hún ~~gaf~~ **rétti** mér stóran ís með ~~sjokólaðe~~ **bragðis** ~~súkkulaði~~ **bragði**.

Ég ~~sat~~ **settist** niður fyrir utan í sólinni og ~~njót~~ **njóta**ð íssins. Ég ~~mælti~~ **sagði** við sjálfan mig: "Það er gott að vera í Reykjavík!"

~~Það~~ **Þetta** var frábær dagur. Ég mun ~~alltaf muna þennan dag~~ **aldrei gleyma þessum degi** þegar ég keypti fyrsta ísinn minn í Reykjavík.

Figure 5: Example of an Icelandic story created by ChatGPT-4 and grammatically proofread by a teacher who is a native speaker of Icelandic.

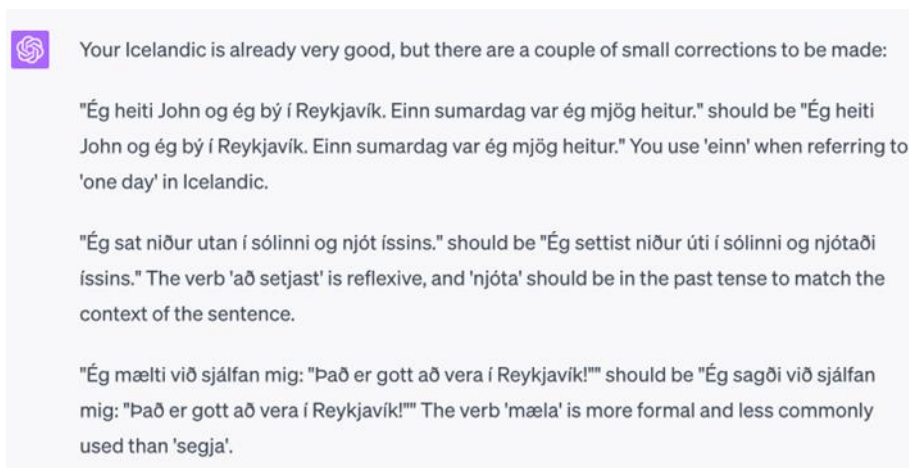


Figure 6: Example of ChatGPT-4 proofreading the same Icelandic as in Figure 5. Prompt used: You are a teacher teaching Icelandic as a second language to adults. Please correct the grammatical mistakes in this story written by a student.

A1:

Ég heiti John og ég bý í Reykjavík. ~~Einn~~ sumardag var ~~mér mjög heitt~~. Ég ákvað að kaupa ~~mér~~ **mér** ís.

Ég ~~fór~~ **ætla** í ísbúð sem er í miðbænum. Ég sagði: „Ég ~~ætla~~ **ætla** að fá einn ís, takk.“ Konan ~~við~~ **við** búðarborðið spurði: „Hvaða bragð viltu?“ Ég vissi ekki hvaða bragð ég vildi. Í búðinni voru margar tegundir ~~íss~~ **margar tegundir af ís**. Ég sagði: „Ég vil ~~gjarna~~ **gjarna** smakka ~~súkkulaðiis~~ **súkkulaðiis**, takk.“

Konan gaf mér smá ~~súkkulaðiis~~ **súkkulaði** á skeið. ~~Hann var mjög góður!~~ **Hann** var mjög **góður!** Ég sagði: "Ég ~~fæ~~ **fæ** einn ~~súkkulaðiis~~ **súkkulaði** takk." Hún ~~lét mig hafa~~ **lét mig hafa** stóran ís með ~~súkkulaði~~ **súkkulaði** bragði.

Ég ~~settist niður~~ **settist** í sólinni og ~~naut~~ **naut**ð íssins. Ég ~~sagði~~ **sagði** við sjálfan mig: „Það er gott að vera í Reykjavík!“

~~Þetta~~ **Þetta** var frábær dagur. Ég mun ~~alltaf muna þennan dag~~ **daginn** þegar ég keypti fyrsta ísinn minn í Reykjavík.

Figure 7: Example of the A1 Icelandic story created by ChatGPT-4 and grammatically proofread by a non-teacher who is a native speaker of Icelandic.

A1:

Ég heiti John og ég bý í Reykjavík. Einn sumardag var mér mjög heitt. Ég ákvað að kaupa ís.

Ég gekk í ísbúð sem er í miðbænum. Ég sagði: "Ég vil einn ís, takk." Konan að baki búðarborðsins spurði: "Hvaða bragð viltu?" Ég vissi ekki hvaða bragð ég vildi. Í búðinni voru margar tegundir íss. Ég sagði: "Ég vil smakka sjokóladeiss, takk."

Konan gaf mér smá sjokóladeis á skeið. Hann var mjög góður! Ég sagði: "Ég ætla að fá sjokóladeis, takk." Hún gaf mér stóran ís með sjokóladebragði.

Ég settist niður úti í sólinni og naut íssins. Ég sagði við sjálfan mig: "Það er gott að vera í Reykjavík!"

Þetta var frábær dagur. Ég mun alltaf muna þennan dag þegar ég keypti fyrsta ísinn minn í Reykjavík.

Figure 8: Example of the A1 Icelandic story created by ChatGPT-4 and grammatically proofread by an additional non-teacher who is a native speaker of Icelandic.