Improving English Education in Japan: Leveraging Large Language Models for Personalized and Skill-Diverse Learning*

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Abstract

The introduction of advanced generative AI has significantly impacted higher education, particularly in language learning. In Japan's test-oriented and teacher-centered English education system, students have limited opportunities to leverage generative AI for developing critical skills like analysis, evaluation, and creativity. This learning is often passive, focusing on memorization and testing rather than fostering higher-order thinking skills (HOTS). To address these challenges, the authors propose an AI-enhanced language teaching method that integrates HOTS with lower-order thinking skills (LOTS), based on Bloom's revised taxonomy. This approach encourages deeper engagement, critical thinking, and active learning through AI-supported activities like synthesizing information and problem-solving. The proposed method employs large language models, such as LLaMA 3, to deliver personalized learning experiences tailored to students' English proficiency and personal interests. Pre-prompts are used to focus learning on specific goals, such as vocabulary, grammar, and pronunciation. Additionally, plans to integrate the system with an AI assistant robot aim to further enhance interactivity and immersion in the learning process. Despite concerns about reduced human interaction, privacy issues, algorithmic bias, and accessibility challenges, AI-powered language learning may offer significant benefits in Japan's higher education context. By providing a safe, non-judgmental environment, generative AI can help overcome communication barriers, build student confidence, and support the digitalization of Japan's education system, ultimately contributing to the development of global human resources.

Keywords

English Education in Japan, Large Language Models (LLMs), Personalized Learning, Critical Thinking Skills

1. Introduction

In the field of language education, the integration of advanced AI technology presents a compelling opportunity to revolutionize traditional teaching methods. Imagine a future where language learning is tailored to the unique needs of each student, offering personalized experiences that enhance engagement and learning outcomes. However, the journey towards AI-driven language education is not without its challenges, particularly within the context of Japan's education system, which values tradition and passive learning focused on memorization.

In this study, we explore the potential of language teaching enhanced by generative AI while addressing the practical issues faced in Japan's educational landscape. The introduction of AI technology in language education holds the promise of individualized learning experiences that cater to diverse learning styles and preferences. By leveraging generative AI, language learning platforms can analyze the students' strengths and weaknesses, providing targeted support and feedback tailored to their specific needs. Additionally, AI-driven content delivery systems can adapt in real-time to students' progress, ensuring that lessons remain engaging and relevant.

By leveraging established educational principles, namely the revised Bloom's taxonomy, our research seeks to enhance language education through the integration of generative AI. By equipping students

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with both lower-order and higher-order thinking skills, our methodology aims for a holistic learning experience that prepares students for success in the digital age. However, the implementation of generative AI in language education is not without its challenges, as the Japanese education system has long prioritized standardized testing and teacher-centered instruction, requiring a shift in pedagogical approaches and a re-evaluation of traditional teaching paradigms. Through a systematic examination of both the opportunities and obstacles, this research aims to provide practical insights for educators and policymakers.

To explore this potential, a survey was conducted with 84 university students, focusing on their use of ChatGPT as a learning tool. Building on these insights, a generative AI-powered learning system has been developed as a pilot project, leveraging Large Language Models (LLMs), namely LLaMA 3. This system offers personalized educational experiences by understanding and generating human-like language. The chatbot's use of pre-prompts ensures focused learning on specific goals, such as vocabulary and grammar. A planned integration the chatbot with an AI assistant robot to create a more immersive learning environment.

2. Background

2.1. English education in Japan

Japan's education system is known for its traditional approach, emphasizing rote memorization and standardized testing [1]. In the context of English education, this often results in a focus on passive learning and comprehension rather than the development of critical thinking and creativity. Students typically encounter limited opportunities for personalized learning experiences tailored to their individual needs and preferences [2].

The system is facing a multitude of issues that hinder its ability to fully meet the evolving needs of students in the 21st century. Foremost among these challenges is the pressure placed on students, stemming from the system's heavy reliance on standardized testing as the primary measure of academic success [3]. This emphasis on exam performance not only fosters a hyper-competitive atmosphere, contributing to heightened stress levels, but also interferes with the development of critical thinking, problem-solving, and creativity among students. Furthermore, the teachers within this system often contend with overwhelming workloads, including administrative burdens that detract from their capacity to deliver engaging and personalized instruction [4]. Also, opportunities for developing and applying innovative teaching methods and tailored learning experiences are indeed constrained by various factors inherent in the conservative nature and strict hierarchy of the Japanese education system [5]. The entrenched traditionalism within the system often resists change and experimentation, favoring stability and conformity over innovation and flexibility. These systemic challenges underscore the urgent need for comprehensive reforms and innovative solutions to ensure that Japan's education system remains relevant and effective in preparing students for the complexities of the modern world.

2.2. Artificial intelligence in education

In recent years, the integration of generative artificial intelligence (AI) models, particularly OpenAI's ChatGPT, into education has garnered significant attention. Various studies have highlighted both the potential benefits and challenges of this technology in enhancing learning outcomes. The integration of AI technology, specifically large language models like ChatGPT, into the education system presents an opportunity to address these limitations and enhance the learning experience for students.

ChatGPT offers personalized tutoring by tailoring educational content to meet individual student needs, thereby fostering a more customized learning experience. Studies by Baidoo-Anu and Owusu Ansah [6] emphasize its ability to provide ongoing feedback and promote self-directed learning, which is critical in improving students' engagement and motivation. Similarly, Su and Yang [7] argue that ChatGPT's application in creating virtual tutors can provide real-time, personalized feedback, making it a valuable tool in both formal and informal learning settings.

AI-powered chatbots, including ChatGPT, have been utilized to create interactive learning environments that support self-paced education. In a study by Adiguzel et al. [8], the authors highlight the potential of ChatGPT to generate interactive and engaging learning scenarios, which promote deep thinking and problem-solving. Another key advantage of using ChatGPT in education is its ability to handle routine tasks such as grading and administrative work, which allows teachers to focus more on instructional design and student support. This frees up more time for personalized instruction and student interaction. This allows teachers to focus on facilitating meaningful learning experiences and fostering critical thinking skills in their students [9]. Studies suggest that ChatGPT can automate essay grading, providing accurate assessments of student work, which can save educators considerable time [6], [7].

Despite its benefits, the implementation of ChatGPT in education is not without challenges. One major issue is the risk of perpetuating biases embedded in the data used to train these models. Baidoo-Anu and Owusu Ansah [6] caution that generative AI may unintentionally amplify existing biases, which can affect the fairness and equity of educational tools. Similarly, Mhlanga [10] raises concerns about privacy and the ethical use of generative AI in educational settings, calling for transparency and fairness to be prioritized when integrating such technologies into classrooms. Additional concerns include for example, ethical issues related to academic dishonesty and the potential displacement of educators [11].

However, the current solutions mostly rely on ChatGPT without considering the needs of individual students, highlighting a critical gap in the application of generative AI in education. By leveraging AI-powered tools and platforms, personalized learning pathways can be developed based on students' abilities, interests, and learning styles. AI algorithms can provide valuable insights into students' strengths and weaknesses, enabling educators to tailor instruction accordingly. Moreover, generative AI can facilitate adaptive learning environments where content delivery is adjusted in real-time based on students' progress and comprehension levels, ultimately promoting a more effective and individualized educational experience. This ensures that students receive the appropriate level of challenge and support, promoting deeper engagement and understanding [12], [13].

Overall, the integration of generative AI has the potential to revolutionize Japan's education system by promoting personalized learning, fostering critical thinking skills, and enhancing overall educational outcomes. Our goal is to create a solution that utilizes generative AI to not only adapt to individual learning needs but also to cultivate a more dynamic, interactive and student-centered learning environment based on Bloom's revised taxonomy. By incorporating elements from all levels of Bloom's taxonomy we aim to enhance students' critical thinking abilities and empower both students and educators to engage in a more meaningful educational experience. We seek to develop higher-order thinking skills, ensuring that students are equipped to navigate complex problems and contribute effectively in their academic and professional endeavors and to better prepares them for global success.

2.3. Bloom's taxonomy

One potential attempt to challenge the circumstance of the prevailing traditional language learning approach in Japan is to deconstruct and reconstruct the learning process using Bloom's taxonomy. Bloom's taxonomy is widely acknowledged for its role in mastering learning [14], as it delineates the knowledge and skills necessary to facilitate learners' mental processes [15],[16], [17], [18], [19], [20], [21], [22]. Introduced by Benjamin Samuel Bloom in 1956, this taxonomy aims to investigate learners' cognitive skills to enhance learning and to develop teaching strategies that progress from lower-order cognitive skills to higher-order cognitive skills [23].

The Bloom's framework was later revised by Anderson and Krathwohl [24] to include six components, which are described below:

- Remembering: Retrieving, recognizing, and recalling relevant knowledge from long-term memory.
- Understanding: Constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining.

- Applying: Carrying out or using a procedure through executing or implementing.
- Analyzing: Breaking material into constituent parts, determining how the parts relate to one another and to an overall structure or purpose through differentiating, organizing, and attributing.
- Evaluating: Making judgements based on criteria and standards through checking and critiquing.
- Creating: Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing.

Bloom's taxonomy serves as a valuable tool for fostering the advancement of higher-order thinking skills, which are crucial qualifications for both life and careers among students. Additionally, instructional lessons formulated using Bloom's taxonomy tend to transition towards a more student-centered approach, emphasizing cognitive awareness and empowering students with control over their learning activities.

One of the primary components of Bloom's taxonomy involves student self-assessment and/or self-evaluation, which is closely associated with the development of higher-order thinking skills in student-centered learning. The student self-assessment [25] allows for valuable development of one's learning, as it aligns with principles of double-loop learning [26], student self-regulation and self-management, and the student-centered classroom [27].

Within the framework of Bloom's taxonomy, learning extends beyond mere evaluation of work to encompass reflection on learning, engagement in thought processes, and enhancement of higher-order thinking skills. However, a challenge arises regarding the extent to which a teacher can support students in mastering learning in depth. Self-regulated learning is also necessary, with consistent support. To overcome this challenge and to master learning effectively, there is promise in current AI technology-based learning, as it enables the practice of higher-order thinking skills and the development of cognitive skills through ongoing interaction with generative AI.

3. Implementation

3.1. Lesson plan

We present two lesson plan examples that demonstrate how generative AI can be incorporated into writing and reading, as well as speaking and listening activities. These lesson plans aim to engage students in interactive learning experiences while leveraging AI-powered feedback to enhance their skills. By combining traditional pedagogical approaches with generative AI, educators can create dynamic and personalized learning environments that cater to the diverse needs and preferences of students.

Writing & Reading Lesson plan example (Figure 1)

1. Write an Essay TOPIC: Recently, the number of car accidents due to smartphone use has been increased. Provide three solutions to reduce accidents resulting from smartphone use in public areas.
2. Brainstorming and search about the problem and solutions (understand)
3. Plan & write an outline.
4. Write Problem solving essay organization. 5 paragraphs essay. (Remember/recall)
5. AI feedback Accuracy check: Organization, Grammar, Spelling, Remember & Compare the Essay organization Understand the feedback from AI device Apply the feedback from AI device Analyze the own writing drafts Evaluate the feedback from AI and writing drafts Create & rewrite the essays

6. Revise & rewrite
7. Final draft

Speaking & Listening Lesson plan example (Figure 2)

1. Have a conversation with AI-device TOPIC: I am going to England next month.
2. Prepare a few questions What should I prepare? Where do you recommend to go? What can I do in England? Can you give me some advice? Etc.
3. Submit the conversation script
4. Evaluate the conversation script and understand the self-level

Figure 1: Writing lesson plan example

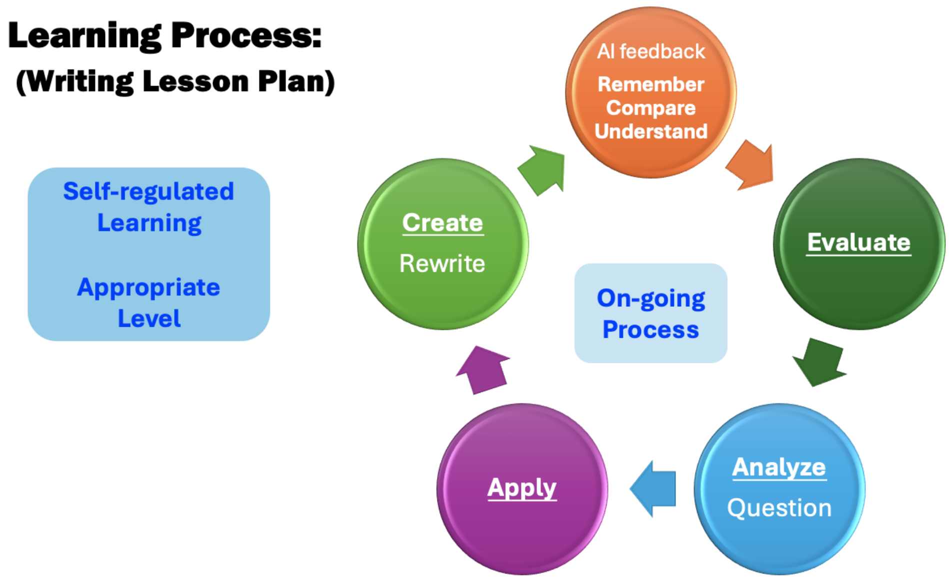
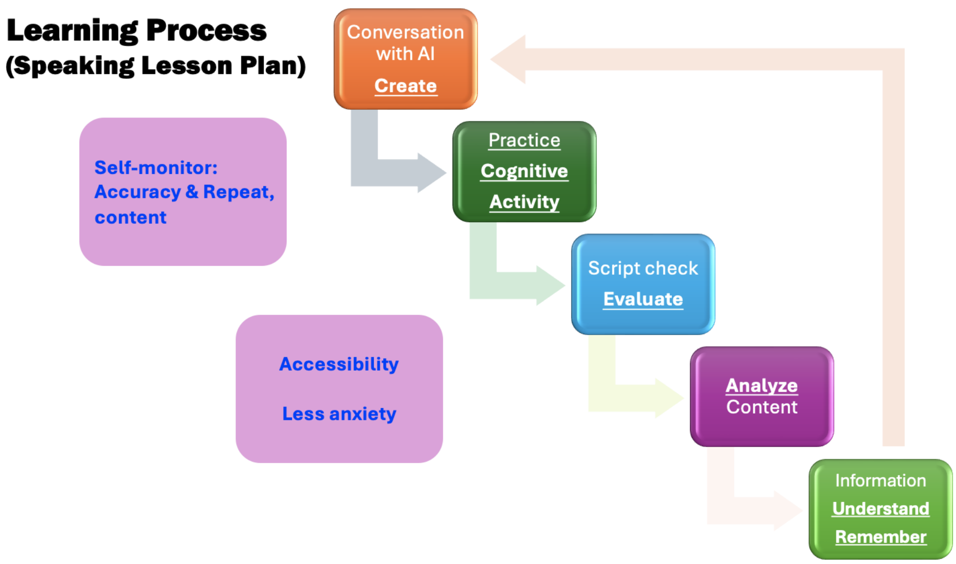


Figure 2: Speaking lesson plan example



In the writing and reading lesson plan example, students are tasked with writing an essay on the topic of car accidents resulting from smartphone use in public areas. The lesson progresses through brainstorming and research, outlining, drafting, receiving AI feedback, revising, and ultimately producing a final draft. AI feedback is utilized to assess organization, grammar, and spelling, helping students refine their writing skills through iterative improvements. Similarly, in the speaking and listening lesson plan example, students engage in a conversation with an AI device about their upcoming trip to England. They prepare questions, submit the conversation script, and evaluate their performance, gaining insights into their speaking and listening abilities. These lesson plans demonstrate how generative AI can support and enhance language learning experiences, fostering student engagement and skill development.

3.2. Preliminary survey

We conducted a preliminary survey to understand students' thoughts on using ChatGPT as a tool for learning. The survey aimed to gather insights into students' experiences, perceived benefits, challenges, and overall satisfaction with ChatGPT in an educational context. The results provide valuable feedback for educators and developers to enhance the effectiveness of educational tools that utilize generative AI.

A questionnaire was designed and distributed to a sample of 84 second-year undergraduate students. The survey included both quantitative and qualitative questions, covering various aspects of their experience, including ease of use, effectiveness, benefits and detriments, and overall satisfaction. The questions are listed in Appendix A. The survey results provide a detailed overview of students' experiences and perceptions regarding the use of ChatGPT in their educational activities. The data indicates that only about 14% of students had previously used ChatGPT in other classes, suggesting that its adoption in educational contexts may still be relatively new.

A significant challenge noted was the difficulty in using ChatGPT, with over 91% of students reporting some level of difficulty. Most commonly, the students had difficulties in designing prompts or saying that the answer was not what they wanted or that it was too long. Despite these challenges, an overwhelming majority of students found ChatGPT to be helpful in class, with 98% acknowledging its positive impact, praising it for being able to give you new ideas and refine your writing. Similarly, 95% of students agreed that ChatGPT assisted in their learning process by providing them with easily accessible new knowledge, reinforcing its effectiveness as an educational tool. They also said that it can revise your answers and improve your thinking skills.

The survey also explored whether students' opinions of ChatGPT changed after using it, with nearly 60% reporting a shift in perspective. The comments reflected both positive experiences and the recognition of areas where the tool could improve. In terms of potential enhancements, 74% of respondents believe that ChatGPT needs improvement. The students especially wanted to be sure that the information is reliable and that ChatGPT should give sources for the generated information. They also wished it to be easier to get the answers they wanted, which links to the earlier mentioned difficulties.

When asked about future use, 90% of students expressed a desire to use ChatGPT in class again, and 95% were interested in taking a dedicated ChatGPT class. Many students stated that ChatGPT will be useful for them later when they enter the workforce. These figures suggest strong interest and confidence in the tool's potential to support learning.

Finally, the overall satisfaction level was notably high, with an average rating of 4.23 out of 5. This satisfaction level underscores the positive reception of ChatGPT among students, despite the identified challenges and areas for improvement. Overall, the survey results reflect a generally positive attitude towards ChatGPT, with significant interest in its continued use and development within educational contexts.

The survey results indicate that while a significant portion of students found ChatGPT to be a beneficial tool for learning, there are areas that require attention. Addressing challenges such as occasional misunderstandings of AI responses and technical issues is crucial. The feedback suggests a need for enhanced personalization and more robust technical support to maximize the benefits of using

ChatGPT in educational settings.

Based on the survey findings, several recommendations are proposed to improve the use of ChatGPT in educational contexts. Incorporating more personalized learning experiences, addressing technical issues to ensure seamless usage, and providing additional resources and support for students are key steps to enhance the effectiveness and satisfaction of using AI-driven educational tools. As 90% of the respodents stated that they would like to take a class where they would learn about using generative AI. We are planning to implement this as a part of an introductory course for first year students.

While the overall response is positive, addressing the identified challenges can further enhance the effectiveness and satisfaction of students using educational tools based on generative AI. The findings underscore the potential of AI in revolutionizing language education and offer a roadmap for future improvements in integrating generative AI into educational practices.

3.3. Artificial intelligence system

In practice, the implementation of an AI-powered learning solution leveraging Large Language Models (LLMs) is made possible by recent advancements in the field of Natural Language Processing (NLP). LLMs are trained on vast amounts of text data, enabling them to understand and generate human-like language with remarkable accuracy. This capability allows educational tools powered by LLMs to provide tailored learning experiences that adapt to each student's individual needs, preferences, and learning style. These developments have opened up new possibilities for creating intelligent educational tools and platforms that can understand, generate, and interact with human language in meaningful ways. With the aid of LLMs, educators can harness the power of AI to provide personalized and adaptive learning experiences for students.

The implementation of an AI-powered learning solution leveraging Large Language Models (LLMs) can take different forms, depending on factors such as infrastructure, privacy considerations, and the desired level of control. This comes down to two approaches: utilizing third-party managed models like ChatGPT or running a local LLM. Using third-party models like involves integrating pre-trained LLMs, such as ChatGPT, into educational platforms or chatbot applications. These third-party models are hosted and maintained by external providers, offering out-of-the-box functionality for natural language understanding and generation, reducing development time and effort.

Alternatively, there is the option to run a local LLM, either in a centralized or distributed manner. In a centralized setup, a single server hosts the LLM, while in a distributed setup, each student receives a dedicated device running a localized instance of the LLM. These approaches prioritize privacy and security, ensuring data remains on-premises, while also allowing for customization at the cost of requiring more specialized hardware. While the latter also comes with the added benefit of enabling offline access, running LLMs on edge devices is still challenging due to performance issues. However, this might change in the near future as the field is evolving rapidly.

3.3.1. Pilot system

As a pilot system, we are running a centralized local LLM. The architecture of the chatbot is designed to integrate state-of-the-art AI models with high-performance hardware and a user-friendly interface. The system uses the LLaMA 3 model [28], chosen for its superior natural language processing capabilities, running on Ollama[1]. The model has been trained on extensive and diverse datasets encompassing various aspects of the English language, including conversational contexts, academic discourse, and everyday language use. This comprehensive training allows the models to support users in enhancing their vocabulary, grammar, pronunciation, and conversational proficiency.

To optimize the learning experience, the chatbot employs pre-prompts, which are strategically designed prompts that guide the conversation depending on the chosen learning setting (beginner conversation, job interview practice, etc.). Pre-prompts help maintain the focus on specific educational objectives such as vocabulary acquisition, grammatical accuracy, and pronunciation improvement. By

[1]https://github.com/ollama

using pre-prompts, the chatbot can deliver materials tailored to the user's proficiency level and learning goals.

The OpenWebUI[2] serves as the primary medium for user interaction with the chatbot. This ChatGPT-like interface is designed to be intuitive and user-friendly, facilitating smooth and real-time communication between the user and the chatbot. The OpenWebUI supports speech inputs, enabling users to practice conversation. Accessible through http, the user interface can be connected to by almost any device running a modern browser.

The system's computational needs are met by the NVIDIA RTX A5000 GPU with 24GB of GDDR6 memory and 8192 CUDA cores. This ensures the efficient execution of complex NLP tasks, thereby delivering low latency and high throughput. This hardware configuration is essential for maintaining the system's responsiveness and ensuring a seamless user experience, particularly during extended and complex interactions.

A significant future enhancement involves integrating the chatbot with the AI assistant robot, Temi[3]. This integration aims to create a more immersive and interactive learning environment by combining the virtual capabilities of the chatbot with the physical presence of Temi. Temi will be connected to the same LLaMa 3 model, enabling it to engage in real-time conversations, provide immediate feedback, and facilitate hands-on learning activities. This hybrid approach is expected to enhance user engagement and improve learning outcomes by offering a dynamic and interactive educational experience. We are about to hold another survey regarding the use of the pilot system, this time with both students and teachers, in order to develop it to be better suited for classroom use. After the robot integration is completed, we plan to do a followup survey for both students and teachers in order to get more feedback and to optimize the system for classroom use.

Additionally, we are exploring the integration of Retrieval-Augmented Generation (RAG) technology. RAG allows the model to pull information from new data sources, for example course-specific databases, offering students more precise and relevant content tailored to their educational needs. This technology can significantly enhance the personalization of learning experiences, where the model can adapt not only to individual learning styles but also to the specific content of a course, providing contextualized assistance that improves comprehension and retention.

4. Limitations and future prospects

While the integration of generative AI in education holds tremendous promise, several limitations warrant consideration. Firstly, there's a risk of diminished human interaction as generative AI tools may replace meaningful teacher-student engagement, potentially impacting students' social and emotional development. Privacy concerns arise regarding the collection and utilization of student data for personalized learning, raising ethical questions about data privacy and security.

Algorithm bias is another challenge, as generative AI models can perpetuate existing inequalities or favor certain demographics over others in educational outcomes. Accessibility remains a concern, with students lacking access to technology or digital literacy skills potentially being left behind in AI-powered learning environments. Moreover, an overemphasis on standardized testing may overshadow the cultivation of critical thinking and creativity, limiting the holistic development of students. Dependence on technology introduces vulnerabilities, such as technical failures or cyberattacks, while teacher resistance and training needs may hinder effective implementation. Teachers may feel apprehensive about the integration of AI, fearing that it might replace their role or undermine their authority in the classroom.

Additionally, concerns about navigating new technologies, potential job displacement, and the perceived threat to pedagogical control may further intensify resistance. To mitigate these risks, it is essential to provide teachers with comprehensive training and ongoing support, demonstrating how AI can complement rather than replace their expertise. Encouraging collaboration between educators and

[2]https://github.com/open-webui
[3]https://www.robotemi.com/

AI systems can highlight how these tools can assist with routine tasks, such as grading or providing personalized feedback, allowing teachers to focus on more complex, higher-order teaching activities. By involving teachers in the development and implementation process, their concerns can be addressed, and their role in an AI-enhanced educational environment can be clearly defined, ensuring they feel valued and integral to student success. Ethical considerations surrounding decision-making by generative AI in education require careful oversight, and the financial costs associated with implementing generative AI pose challenges for resource-strapped institutions.

Lastly, there's a risk of students becoming overly dependent on AI assistance, potentially hindering the development of independent learning skills. Addressing these limitations requires thoughtful planning, ongoing evaluation, and a commitment to ethical and inclusive practices in AI integration within educational settings.

Still, the future of generative AI in education is promising, with potential to revolutionize personalized learning, content creation, and assessment. AI can create customized learning paths, generate high-quality materials, and provide real-time feedback. It will enhance accessibility through inclusive tools and language translation, and support data-driven decision-making with predictive analytics. AI will also facilitate lifelong learning and workforce training, and foster global collaboration.

In the future, we will explore the potential for generalizing the proposed method beyond Japan's education system. While the current focus addresses the specific challenges of Japan's test-oriented and teacher-centered education, many of the underlying principles—such as fostering personalized learning, critical thinking, and integrating higher-order thinking skills (HOTS) through AI—are universally applicable. Future research will involve testing these approaches in different educational contexts globally, adapting them to local curricula, cultural norms, and technological infrastructures. Additionally, further investigation will be required to assess how AI systems can mitigate common issues like teacher resistance, data privacy concerns, and algorithmic biases in a variety of educational environments. We aim to contribute to a broader, global shift toward more dynamic, personalized, and effective educational systems. Overall, AI integration in education promises more personalized, inclusive, and effective learning experiences, preparing students for success in a digital world.

5. Conclusions

The recent introduction of advanced generative AI has ushered in a new era of possibilities across various fields, including higher education language learning. The advent of this technology presents an array of opportunities, including the provision of personalized learning experiences tailored to individual student needs, seamless accessibility around-the-clock, immediate feedback mechanisms, and adaptive content delivery aimed at enhancing overall learning outcomes. However, within the predominantly test-oriented and teacher-centered landscape of English education in Japan, the integration of generative AI remains underutilized, limiting students' exposure to diverse skills crucial for future career success. Often, learning experiences tend to be passive, focusing primarily on memorization, comprehension, and testing, neglecting the development of essential higher-order thinking skills (HOTS) such as analysis, evaluation, and creativity.

To address this gap, we propose an innovative generative AI-enhanced language teaching method designed to cultivate both lower-order thinking skills (LOTS) and higher-order thinking skills (HOTS) as delineated by the revised Bloom's taxonomy (2001) for educational goals. While LOTS are typically developed through passive learning activities in traditional classrooms, the acquisition of HOTS requires deeper engagement and critical thinking. By integrating generative AI into the learning process, students can enhance their analytical and evaluative abilities by synthesizing information, presenting solutions, and expanding their knowledge base. This approach facilitates tailored learning experiences that cater to individual English proficiency levels and personal interests, thereby optimizing learning outcomes. As students attain proficiency in HOTS and confidence in their abilities, they are better equipped to apply their learning to academic and real-world career contexts.

We conducted a survey to understand students' thoughts on using AI for learning. The survey involved 84 second-year university students who answered questions about their experiences using ChatGPT as a learning tool. While only 14% had prior experience with it, 98% found it helpful in class, particularly for generating ideas and improving writing. However, 91% faced challenges, mainly with prompt design and receiving relevant answers. Despite this, 95% acknowledged ChatGPT's role in enhancing learning and expressed interest in continued use, with 90% wanting to use it in future classes. Overall satisfaction was high (4.23/5), highlighting the tool's potential, though improvements in reliability and ease of use are needed.

After analyzing the results of the survey, a generative AI-powered learning system using Large Language Models (LLMs) has been implemented as a pilot project. Utilizing the LLaMA 3 model, the system offers personalized educational experiences by understanding and generating human-like language. The chatbot uses pre-prompts to focus on specific learning goals such as vocabulary, grammar, and pronunciation. Future enhancements include integrating the chatbot with an AI assistant robot for a more immersive and interactive learning environment. A followup survey for both students and teachers will guide further development to optimize the system for classroom use.

Despite the evident benefits, the integration of generative AI-powered language teaching raises legitimate concerns regarding limited human interaction, privacy, algorithm bias, and accessibility challenges. However, within the context of Japanese higher education, these challenges are outweighed by the opportunities presented. AI-powered language learning environments offer students a safe and non-judgmental space to overcome communication barriers, foster confidence, and navigate hierarchical constraints often encountered in traditional English classrooms. Ultimately, the digitalization of the Japanese education system through AI integration contributes to the development of globally competitive human resources, equipped with the essential skills and competencies necessary for success in the digital age.

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A. Survey Questions

1. 今まで、他の授業でChatGPTを利用した授業をした事がありますか。
   YES・NO

2. ChatGPTを使用する際に難しかった事はありましたか。それはなんですか

3. ChatGPTを使った授業は何に役に立ったと思いますか。

4. ChatGPTは自分の学びに役に立つと思いますか。

5. ChatGPTの授業を受ける前と受けた後、ChatGPTに対する意見が変わりましたか。

6. ChatGPTを使う時に、改善するべきところはありますか。それは何ですか。

7. 今後の授業でまたChatGPTを使った授業を受けたいですか。YES・NO

8. ChatGPTの使い方を学ぶ授業は必要だと思いますか。YES・NO

9. ChatGPTを使った時に、自分の学びをより発展させる事が出来ると思いますか

10. ChatGPTを使った授業に対する満足度を選んでください。
    □ 非常に満足
    □ 満足
    □ 普通
    □ 不満
    □ 非常に不満

11. ChatGPTを利用してみて、どう思いましたか。授業の感想を書いてください。（良い点、悪い点、難しかった点など、自由に書いてください。）