



Integrating Artificial Intelligence into Language Pedagogy: A Step-by-Step Tutorial for Creating Question-Making Games

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ABSTRACT

This article presents a practical tutorial for language instructors, intending to explore the integration of artificial intelligence (AI) into teaching and the enhancement of classroom effectiveness through the design of interactive question-making games. Question-making exercises constitute a pivotal element in the realm of language acquisition. However, conventional classroom designs frequently entail high levels of repetition and protracted procedures. The integration of AI within educational software facilitates the automated generation of question banks, responses, and HTML-based interactive games that are directly applicable to the classroom setting, thereby eliminating the need for programming expertise. The tutorial provides a comprehensive process, from the preparation of teaching materials and the design of prompts to the generation of interactive games with scoring, timing, and real-time feedback features. This approach not only reduces the technical barriers for instructors but also substantially enhances student engagement and promotes the transformation of instructors' roles into "learning experience designers." While the accuracy and appropriate use of AI outputs require further attention, this study demonstrates the practical potential of AI in promoting gamified learning in language classrooms.

Keywords: AI in Education; Language Pedagogy; Gamification; Question-Making; Interactive Learning; Instructors Training

INTRODUCTION

In the domain of education, the conventional teacher-centered "top-down" pedagogical model has progressively encountered challenges in aligning with the learning requirements of the contemporary era. Since the 1970s, a considerable body of research has demonstrated the efficacy of student-centered teaching methods in stimulating learners' interest and intrinsic motivation, enhancing their proactive engagement in self-directed learning, and consequently achieving superior learning outcomes (see Piaget, 1970; Vygotsky, 1978; Rogers, 1969; Maslow, 1970; Hymes, 1972; Canale & Swain, 1980; Holec, 1981). In the second decade of the 21st century, rapid technological advancements have driven educational innovation, with gamified learning emerging as a key component of classroom instruction and practice in global language education. With the proliferation of artificial intelligence (AI), particularly large language models (LLM), and the rapid advancement of gamified learning, the field of language education is experiencing a paradigm shift in teaching methodologies (see Deterding et al., 2011; Zawacki-Richter et al., 2019; Holmes et al., 2022; Landers, 2022; Reinders & White, 2023). AI-powered educational solutions not only improve learning interaction, but also offer instructors more instructional design alternatives (see Godwin-Jones, 2021; Yeh, 2024; Palomares Marín et al., 2025; Rashid et al., 2025).

However, the implementation of this technology among instructors remains significantly constrained. In the initial stages of language acquisition, question words and sentences, as high-frequency language items, necessitate thorough mastery from learners. However, under conventional pedagogical frameworks, the instruction and learning of such content frequently exhibit a paucity of engagement, resulting in inadequate

learner motivation and challenges in obtaining timely and effective feedback. This, in turn, adversely impacts the outcomes of teaching and learning.

Problem Statement

1. Question-making exercises in traditional teaching models have severe drawbacks, which are primarily shown in tedious and dull practice formats, a lack of engagement, and insufficient personalization.
2. Despite the pervasive integration of LLMs in AI across various devices, including mobile phones, web browsers, and smart home appliances, instructors continue to confront substantial challenges in incorporating technology into their practices. These challenges primarily stem from a dearth of programming expertise and a paucity of readily available reusable templates.

Purpose and Objectives

This paper proposes and introduces a tutorial for language instructors on the subject of generating gamified question-making exercises. The utilization of prevailing, no-cost AI LLM platforms fosters the generation of code and reusable templates. It has been demonstrated that, throughout the process, instructors are not required to possess expertise in programming to create personalized exercises. The objectives of this product are as follows:

1. To provide instructors with the tools necessary to utilize AI to automatically generate a question bank for use in question-making games.
2. To provide instructors with the tools necessary to swiftly customize personalized games in accordance with the objectives of the classroom.
3. To enhance student engagement and learning motivation.

PRODUCT DESCRIPTION & METHODOLOGY

This tutorial is an AI-assisted instructional design tool for language instructors that uses a design-based research method to enable instructors to quickly create tailored "question creation" games. Instructors do not need programming expertise; they merely prepare teaching materials and enter simple prompts to use AI to generate questions, answers, and game frameworks, which are then exported as HTML games.

The product design process involved not just the R&D team but also Mandarin language lecturers and beginning Mandarin learners. The study conducted interviews with five Mandarin language lecturers from Universiti Teknologi MARA, who expressed issues in teaching interrogative terms and phrases, and were helped in developing the game. Ten students aged 19 to 22 with Malay as their mother language and one semester of Mandarin study were then invited online to participate in product testing.

The entire product design has been divided into four phases (see Figure 1), which guide instructors to utilize AI to create interactive question-making games.

Figure 1: Design ideas



The following assertion is made with the intention of providing a concrete example to support the previously stated argument: the questions that need to be learned in elementary Mandarin can be used as an example. Each component is meticulously subdivided into a series of discrete steps, as illustrated below.

Design

- Needs analysis - Examine students' challenges in learning question sentences via classroom observation and assessments to elucidate their educational objectives.

- Content design - Select important sentence patterns from the textbook and combine them with the five commonly used question words in Elementary Mandarin (shéi, shénme shíhou, jǐ diǎn, nǎlǐ, zuò shénme) to generate question sentences. All question sentences that are generated based on sentence structures must be compiled into an Excel document for use in creating the game interface.
- Game mechanics design - Define the game's mechanisms, such as player roles, number of turns, scoring, timing, and real-time feedback.

Development

- AI tools selection - Choose from a variety of free tools on the market, including ChatGPT, DeepSeek, and Gemini.
- Game generation - Upload the Excel document from 1b) to the AI tool and follow the instructions to generate the game framework. It should be noted that each iteration of the AI tool may produce a unique gaming interface. Instructors can generate many versions to choose the one that best matches their needs.

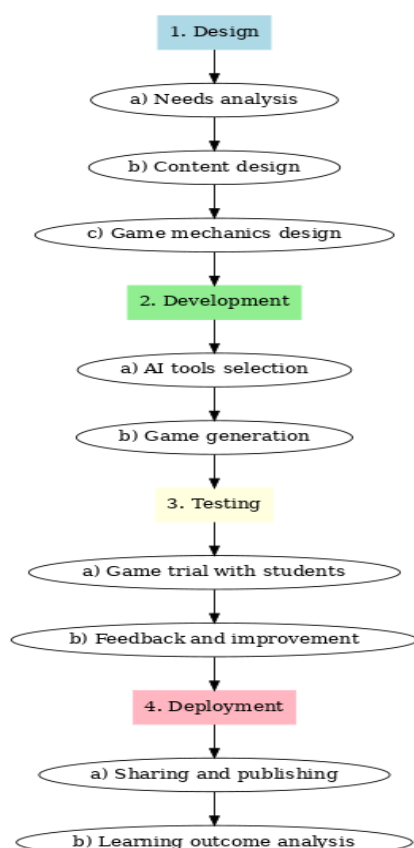
Testing

- Game trial with students - Ten elementary Mandarin language students were chosen to test-play the created game to ensure that it operated properly.
- Feedback and improvement - Ask students about their experiences, and gather thoughts and suggestions for future optimization.

Deployment

- Sharing and publishing - Share or publish the optimized game on learning sites like Google Drive, Padlet, and the school's own learning portal to allow students to download it for self-directed learning.
- Learning outcome analysis - Instructors can use outcome data to examine learning outcomes and make ongoing adjustments in future instruction.

Figure 2: Main steps and sub-steps flow chart

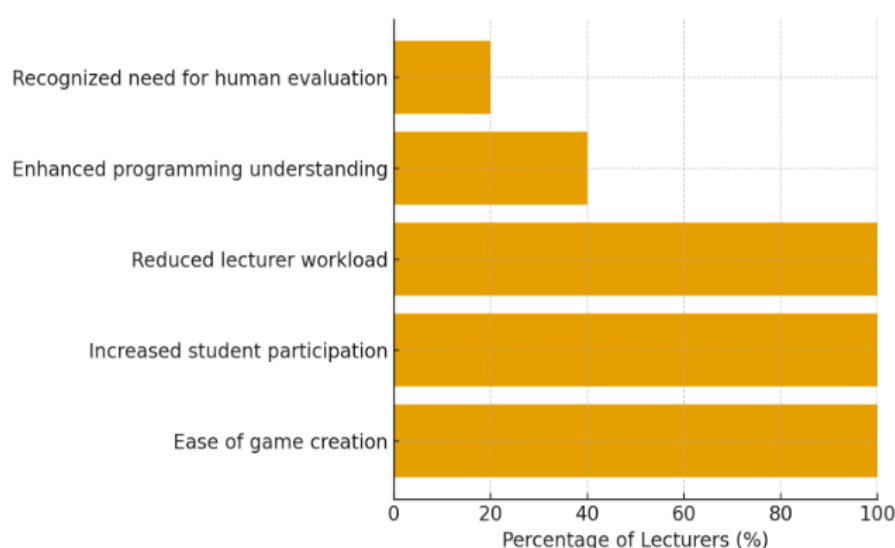


DATA ANALYSIS AND RESULTS OVERVIEW

Feedback from instructors

All lecturers provided excellent feedback on the game design and development process, stating that game creation was simple and easy to learn. Not only did it increase student participation and initiative, but it also relieved lecturers of the laborious, repetitive chore of creating traditional activities. Two lecturers, aged 48 and 50, remarked that this technique helped them learn about computer programming ideas. They acknowledged the experience of learning these new skills while feeling overwhelmed and hesitant at first. Furthermore, one lecturer confirmed the engaging and practical character of AI-generated gamified exercises while emphasizing the continuous necessity for human assessment.

Figure 3: Lecturers' feedback on AI-based game design and development



Feedback from students

All students stated that “game-based activities are more engaging than traditional exercises.” The option to access practice offline is not only convenient but also frees learners from the limits of electronic gadgets, allowing for seamless switching between numerous devices. Student test scores illustrate the efficiency of gamified practice: as compared to traditional exercises, average accuracy increased by 18% while average completion time fell by 22%. Additionally, 80% of students reported that if all exercises were gamified, they would be more motivated to complete them rapidly and without procrastination.

Table 1: Students' feedback and performance improvement in AI-Gamified practice

Category	Metric	Value
Engagement	Students agree that game-based learning is greater than traditional learning	100%
Motivation	Students who would prefer all exercises to be gamified	80%
Accuracy	Improvement over traditional exercises	+18%
Completion time	Reduction compared to traditional exercises	-22%

DISCUSSION

The results of the pilot study indicate that the AI-supported gamified design has a high potential for improving instructors' lesson preparation capabilities while also increasing students' learning motivation and classroom engagement. However, this technique continues to encounter significant challenges:

AI ethics and privacy concerns

Uploading educational data may jeopardize student privacy, while AI models' content development is limited by biases and factual accuracy. Simultaneously, materials published by instructors lack intellectual property protection, making them easily exploited as training material for large language models, infringing on teachers' personal rights.

Instructor role transformation and skill requirements

Although programming is not required, instructors must comprehend rapid design and AI output evaluation skills.

Sustainability of gamified engagement

Student enthusiasm may wane as familiarity grows, necessitating dynamic updates to content and incentive mechanisms.

POTENTIAL FINDINGS AND COMMERCIALISATION

This product is projected to have a favorable impact on both teaching practice and instructor development. Students able to increase their learning interest and engagement by playing interactive games, as well as improve their language correctness and fluency with real-time feedback. Instructors, on the other hand, can use AI to drastically reduce lesson preparation time while also gaining access to more diversified and inventive classroom activity design options. Furthermore, learning data such as points, time spent, and accuracy rates gives instructors new diagnostic tools to assist differentiated instruction and tailored learning paths.

In terms of commercialization, instructors utilize free AI platforms to generate HTML files at a low cost, with the primary expenses coming from teacher training time and design optimization. This product also integrates with learning management systems (LMS) such as Moodle and Canvas, increasing its usefulness for formal coursework and enabling unified curriculum management. Product promotion can be accomplished through educational institution subscriptions that include template libraries and training services or by delivering lightweight applications to schools and private education centers.

LIMITATIONS AND FUTURE RESEARCH

This product demonstrates substantial innovation by deeply merging AI and language training, utilizing cutting-edge technology. Its framework is highly adaptable to many languages and disciplines, with the potential for international promotion. However, the product has limitations, which include i) a small sample size leads to exploratory results; ii) model changes alter AI outputs; iii) a lack of long-term monitoring data inhibits assessment of sustained learning outcomes; and iv) applicability has not been confirmed across languages or learner competency levels.

Future study may investigate the following areas: i) track the long-term impact of AI-gamified learning through longitudinal studies; ii) use learning analytics to provide individualized feedback reports; iii) find the best model for co-designing AI with human instructors.

CONCLUSION

This paper describes an innovative AI-assisted language education strategy that combines technical ease and pedagogical engagement. Using AI-generated interactive question-making games, instructors may quickly create individualized instructional resources. The findings of the pilot study show that this paradigm has tremendous potential for increasing student engagement and learning efficiency. To achieve long-term progress in educational technology, future research should focus on the potential of AI in teaching ethics, learning analytics, and human-machine collaboration models.



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