Integrating AI Literacy into Assignments through AI Chatbots

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Abstract: This practitioner paper introduces an Artificial Intelligence (AI) chatbot designed to support educators in integrating AI into their assignments and assessments. The chatbot transforms traditional assignments into ones that leverage AI tools for scenario-based learning, in-depth exploration, and reflective engagement with course material. By analyzing a diverse set of assignment samples of AI-integrated assessment tasks, the chatbot identifies characteristics such as encouraging students to understand AI's biases and limitations, using AI to enhance creativity and critical thinking, and promoting co-work between students and AI. The proposed chatbot demonstrates its capabilities through exemplar assignments, showcasing its potential to support educators in designing innovative AI-integrated assessments that enrich the learning experience for students.

Keywords: Large language models, assessment, artificial intelligence, teacher support

1. Introduction

Generative Artificial Intelligence (GAI) tools have revolutionized industries by automating routine tasks and enhancing productivity. As AI has become popular across disciplines in practice, teachers are motivated to integrate AI into teaching and assessments. Tan, Cheng and Ling (2024) identified and synthesized 95 relevant research articles on AI in teaching and teacher professional development in K12 and higher education contexts. While these advancements offer opportunities, educators have raised concerns about the potential downsides, such as an over-reliance on technology that might hinder the development of critical thinking skills.

To address these concerns, teachers require a balanced strategy that leverages AI's benefits while preserving the essential human elements of teaching and learning. Specifically, educators are interested in designing assignments that employ AI as a tool for scenario-based learning and reflective engagement with course material. Such assignments could enrich the learning experience and help students understand how to use AI appropriately within their subject areas. However, not all teachers could fully understand AI's affordances. As a result, they may not know how to integrate AI into assignments or design new AI-integrated ones.

This practitioner paper proposes an innovative AI chatbot to support teachers in integrating AI into their assignments. First, examples of current assignments are analyzed using large language models (LLMs) enhanced with advanced reinforcement learning capabilities to identify the key characteristics of practical AI-integrated assessment tasks. Next, these insights guide the transformation of traditional assignments so that students conduct assessments that integrate with AI. Exemplar assignments were used for illustration.

2. Characteristics of AI-Integrated Assignments

To enable the AI chatbot to effectively integrate AI into traditional assignments, the characteristics of AI-integrated assessments have to be identified. A diverse set of assignment samples is analyzed to provide the necessary data for instructing the AI chatbot on AI-integrated assessment design. The training data is sourced from Harvard University's AI Pedagogy project, which curates 34 assignments that exemplify educators' integration of AI.

Sample assignments are processed using ChatGPT 4o, which has the capability of attaching files. Based on the analysis, the typical characteristics of sample assignments are as follows:

- Many assignments encourage students to understand how AI works, its biases, and its limitations. Assignments frequently involve ethical reflection on AI's impact on society, misinformation, and human bias. This can help students develop competency on how should they co-work with AI in the future.
- Assignments are not about replacing student effort but rather co-working with AI to enhance creativity, problem-solving, and critical thinking. In particular, students must verify, critique, and justify AI outputs. AI is also used to simulate scenarios for inspirational thinking, including historical conversations (e.g., interviewing a fictional or historical character. Furthermore, students are often required to compare AI outputs with human insights to identify strengths and weaknesses.

3. AI Chatbot for Integrating AI into Traditional Assignments

The AI chatbot is guided by an instruction prompt that encapsulates the key characteristics of AI-integrated assignments. In addition, sample assignment tasks are provided to enhance the chatbot's performance through few-shot learning techniques. Once the instruction prompt is configured, educators can input their original assignment instructions as text. The AI chatbot then generates a revised version that integrates AI features while preserving the assessment objectives and context of the original assessment. The study processes original assignments using Deep Seek R1 (Feb 2025) in this study. Other LLMs can also be used.

The metaLAB (at) Harvard team provided sample assignments for the analysis in this study, which are shared under the CC BY-NC-SA 4.0 License. The proposed chatbot instruction prompt is also shared with the CC BY-NC-SA 4.0 License. The instruction prompts can be found at https://github.com/cityuhk-dl/DL-Prompt-Library.

3.1 Assignment 1: A Video Assignment of a Simulated Teaching Session

Assignment 1 requires students to act as tutors and create a 10-minute video recording of a simulated teaching session. In the video, students will teach an academic topic of their choice to Year 1 university students. The presentation should clearly state Intended Learning Outcomes (ILOs), Teaching Learning Activities (TLAs), and Assessment Tasks (ATs). The video recording will be assessed based on four dimensions: content, organization, engagement with students, and language. After the analysis, the AI chatbot suggested using tools like ChatGPT to generate a detailed presentation outline and tools like DALL-E to create visuals. The chatbot also suggests ways to evaluate the quality of the AI-generated content and how the AI tool could be used. The chatbot also instructed students on how to reflect on AI use and suggested revising the assessment rubric for accessing AI literacy.

3.2 Assignment 2: An Individual Learning Analytics Case Analysis

In Assignment 2, students have to analyze a weekly assigned research paper on learning analytics, present their critical reflections, and lead class discussions. Each week, self-selected presenters will give a 3-minute presentation, facilitate class discussions, and post a 500-word analytic review. Besides suggesting the assessment task as in Assignment 1, the chatbot suggests students draft potential discussion questions through AI, evaluate them for relevance and depth, and refine them, making class discussions more engaging. Therefore, AI has refined the assignment process holistically.

References

Tan, X., Cheng, G., & Ling, M. H. (2024). Artificial Intelligence in Teaching and Teacher Professional Development: A Systematic Review. *Computers and Education: Artificial Intelligence*, 100355.