

Leveraging the Affordances of Artificial Intelligence Chatbots to Create Differentiated Instructions and Cater to Learners' Differences in an English as a Foreign Language Class

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Abstract

Given the rapid evolution of artificial intelligence (AI), a growing body of literature has investigated the potential benefits it can bring for education in general and language learning in particular. Nonetheless, little research has looked into how to leverage the affordances of AI chatbots to create differentiated instruction (DI) and cater to English as a foreign language (EFL) learners' differences. Thus, we conducted this action research to shed light on (1) learners' perceptions about the affordances of AI chatbots as a tool for differentiated instruction, (2) perceived challenges of integrating AI chatbots in EFL classrooms for differentiated learning, and (3) stakeholders' suggestions to leverage AI chatbots to implement differentiated instruction effectively. This study follows a mixed-method approach, with three main data collection instruments, namely a survey of the students, a follow-up interview with the students, and the teachers' reflective journals. Thematic analysis was used to analyze data from the interviews and reflective journals, while quantitative analysis was used for the surveys. Data analysis reveals the students' and teachers' generally positive perceptions about a variety of affordances provided by AI chatbots, such as quick, personalized feedback, and multimodal input. However, different students perceive some of the affordances differently,

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either as opportunities or difficulties for learning, depending on their learning styles, and most importantly, AI readiness level. Some specific challenges are unearthed, together with the corresponding solutions.

Keywords: AI chatbots, differentiated instructions, learners' differences, affordances of AI

Background

Despite the potential of artificial intelligence (AI) chatbots for education (Alazemi, 2024), little is known about English as a foreign language (EFL) teachers' and learners' perspectives on how AI can be leveraged to support differentiated instruction (DI), which involves adapting the content, process, product and environment to match students' readiness, interests and learning profiles (Tomlinson, 2017).

According to Kamalov et al. (2023) and Roe et al. (2025), AI tools have the potential to help teachers adapt content and activities in real time, support students of different academic backgrounds, tier tasks and help EFL teachers design materials at different difficulty levels.

Hence, through the lens of Tim et al.'s (2017) Technology Affordances Framework (with three stages: affordance perception, actualization and outcomes), this study investigates the use of AI to support content differentiation in EFL. The research questions are:

1. *What are the learners' and teachers' perceptions regarding the affordances of AI chatbots as a tool for DI?*
2. *What are learners' and teachers' perceived challenges of integrating AI chatbots in EFL classrooms for differentiated learning?*
3. *What are learners' and teachers' suggestions for leveraging AI chatbots to implement DI effectively?*

Research Methodology

This action research adopted a mixed-method design, allowing for robust data triangulation through three main data collection instruments, namely a survey of the students, a follow-up interview with the students, and the teachers' reflective journals. Tim et al.'s (2017) Technology Affordances Framework was used to design items in the survey and interviews.

The study was conducted in an EFL class with 15 students (B1-B2 level) at a language center in Vietnam. The two major AI chatbots used for content differentiation in the intervention phase are ChatGPT and NotebookLM.

Thematic analysis was conducted with qualitative data from the interviews and teaching journals, whereas descriptive statistics were used for quantitative data from the survey.

Findings and Discussion

Perceived Affordances of AI for DI

Data from the teaching journals reveals the tremendous potential benefits of AI for DI. These affordances involve supporting teachers in modifying and adjusting learning materials to learners' needs, designing learning activities to suit students at different levels, and creating multimodal learning materials that not only match but also stretch students' learning styles and increase flexibility (Gregersen & MacIntyre, 2014). For instance, teachers could use AI chatbots to create mindmaps, an audio summary of the lesson (via Notebook LM), vocabulary worksheets or supplementary learning materials (ChatGPT) to activate multiple senses, and support students at lower levels in the class.

The student survey and interview data also illuminate students' perceived importance of the various affordances offered by AI to facilitate DI.

Table 1 indicates that the most important perceived affordance is supporting mixed-level classes (highest mean: 4.86). Discussion functionality ranks second (mean: 4.71; standard deviation (SD): 0.71; small variation). The affordance of creating AI-assisted multimodal input (text, audio, images, etc.) which can match and stretch students' learning styles is also perceived to be essential (mean: 4.0) but with very wide variation (SD: 1.31), suggesting the influence of students varied learning style preferences on their perceptions of the importance of this multimodal affordance.

Data from the interview also confirms that multimodal input designed with the aid of AI can "cater to various learning styles, thus fostering engagement and knowledge retention" (Student 5).

Table 2 illustrates how students act upon the affordances of AI for DI. The affordance that the students often take full advantage of the most is the opportunity to discuss different questions regarding EFL lessons with AI chatbots regularly to understand the knowledge more deeply, with the highest mean (5.71), and the lowest variation (SD: 0.45).

The interview data shed more light on students' positive evaluation of this discussion functionality. As Student 6 stated, "Students who are shy or afraid to ask questions in class can feel more confident when learning with a chatbot. It's like having a personal tutor who is always ready to help." This reflects the possible influence of collectivist culture in Vietnamese educational contexts,

Table 1. Perceived importance of AI affordances for DI

Opportunities	Minimum	Maximum	Median	Mean	Standard Deviation
Opportunities to access quick, personalized AI-assisted feedback for speaking/ writing	3.0	5.0	4.0	3.86	0.64
Opportunities to learn with AI-assisted multimodal input (text, audio, images, etc.) which can match and stretch students' learning styles	1.0	5.0	4.0	4.0	1.31
Opportunities to study with learning materials designed for students at different levels in mixed-level classes	3.0	6.0	5.0	4.86	0.99
Opportunities to discuss different questions regarding EFL lessons with AI chatbots to understand the knowledge more deeply	4.0	6.0	5.0	4.71	0.7

where students may feel anxious about questioning teachers in class, being afraid of making mistakes in front of others (Bao & Nguyen, 2020). AI chatbots can become a comfortable learning environment to help students alleviate anxiety and help them feel free to ask questions.

Interestingly, the students perceive and act upon AI affordances for DI in different ways. The interview data shows that some students recognize various learning opportunities, but others may only recognize a limited number of affordances. Moreover, most students said they made use of AI for personalized learning, but others who are more used to using textbooks tend to prefer learning in traditional ways with textbooks. This may be due to the discrepancy in students' AI readiness (Li & Liang, 2025), including their knowledge of AI affordances and their willingness and creativity in interacting with AI tools for individual learning purposes.

Table 2. How students act upon the affordances of AI for DI

Opportunities	Minimum	Maximum	Median	Mean	Standard Deviation
I take full advantage of opportunities to access quick, personalized AI-assisted feedback for speaking/ writing by practising speaking and writing with the help of AI regularly.	4.0	5.0	5.0	4.71	0.45
I take full advantage of opportunities to learn with AI-assisted multimodal input (text, audio, images, etc.) by regularly using the AI-assisted multimodal learning materials to foster my memory and comprehension.	2.0	6.0	4.0	4.29	1.16
I take full advantage of opportunities to study with learning materials designed to suit my language proficiency by regularly using the activities suggested for my level.	4.0	6.0	5.0	5.29	0.7
I take full advantage of opportunities to discuss different questions regarding EFL lessons with AI chatbots regularly to understand the knowledge more deeply.	5.0	6.0	6.0	5.71	0.45

Potential challenges in using AI for DI

For the teachers, three major challenges emerged in the implementation process. The first challenge is the **requirements for profound AI-Technological Pedagogical Content Knowledge (AI-TPACK)** (Ning et al., 2024),

especially the pedagogical knowledge to select and adapt the materials suggested by AI. In the teaching journals, the teachers' reflections emphasize that even with the support of multiple AI tools that assist teachers in designing DI materials, if teachers do not have the necessary pedagogical knowledge to critically select and adapt those materials for learning, the application may still face various hindrances. Teachers may even feel even confused with the overwhelming amount of data and suggestions from AI. The second challenge is the **requirement to have an in-depth understanding of the students' level and their needs**. For instance, the teaching journals reveal that if teachers design multimodal supplementary materials for students to foster their understanding and memory, it is crucial to take students' levels and individual needs into account. If the AI-generated audio summary is too fast for students to hear, for instance, the DI activity may still fail. Finally, **time constraints** are of no less importance. It is quite time-consuming to design differentiated learning materials, even with the support of AI.

For the students, several difficulties were mentioned in the survey and interviews. Notably, 100% of the students perceived overdependence on AI as a common risk of using AI in learning and DI. Moreover, the risks of inaccurate or misleading AI-generated information, and of students being deskilled when just copying answers without sharpening their skills, also attracted the concern of the majority of the students.

Suggestions for Best Practices of AI-assisted DI

The teachers' reflections unveil several suggestions for best practices. First, teachers should start with a good textbook and then develop supplementary DI materials, rather than building materials from scratch to save time and ensure quality. Second, it is fundamental for teachers to equip themselves with profound AI-TPACK, especially pedagogical knowledge, since AI cannot replace teachers' thinking. Teachers should be the final ones who decide on the content or process of DI lessons. Third, teachers are advised to identify their students' specific needs to create a baseline for designing appropriate AI-assisted learning materials. Finally, to save time, teachers should be selective instead of adapting the whole lesson; it is better to design DI components for specific important sections of a lesson.

Students also suggested that teachers should use AI chatbots as virtual teaching assistants that deliver customized learning materials, immediate responses to student-led inquiry and personalized feedback, allowing educators to focus on higher-level instruction while ensuring every student receives appropriate support.

Conclusion

Overall, both teachers and students perceived various affordances that AI chatbots bring to facilitate DI in EFL, including designing different learning materials and personalizing feedback. However, the effective application of AI affordances in DI depends heavily on teachers' sufficient AI-TPACK and students' AI readiness. Notable suggestions involve teachers having a clear understanding of the students' needs, determining the important content of each lesson to design DI practically and instructing students to actively utilize AI chatbots as tutoring tools.

As the study focuses solely on DI regarding content, such aspects as the process and product have not been addressed adequately. Future research should explore how AI tools can support DI in learning processes and products in EFL.

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