

AI use in teaching module and assignment development: Reported practices from Indonesian EFL pre-service teachers

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ABSTRACT

The rapid development of artificial intelligence (AI) in education has not been matched by sufficient research on how pre-service English as a foreign language (EFL) teachers perceive the use of AI for developing instructional modules. This study explores these perceptions among pre-service EFL teachers from three universities in Indonesia who already have experience using AI. Most participants were female, in the final stage of their studies, and enrolled in a micro-teaching course. A survey was administered using an online questionnaire to investigate the practices and experiences of AI among pre-service teachers and analyzed using descriptive quantitative methods. The findings show that the pre-service teachers were enthusiastic yet cautious in using AI. Many used AI regularly, while others used it occasionally. They perceived clear benefits of AI, particularly in generating ideas, improving efficiency, and enhancing the quality of learning materials. AI was most commonly used to design lesson topics, develop content, and create test items. However, several challenges were identified, including plagiarism risks, inconsistent AI-generated outputs, and concerns about overreliance on AI. ChatGPT was the most frequently used tool, and participants expressed interest in more adaptive features that tailor content to students' needs. The study recommends that AI use in teacher education be guided by instructors, with limited use in student assignments to maintain ethical standards and critical thinking skills. These findings provide valuable insights into AI literacy and pedagogical AI applications, contributing to the development of AI-adaptive teacher education curricula.

Keywords: AI literacy; AI perceptions, pre-service EFL teachers; student assignments; teaching module development

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INTRODUCTION

Artificial intelligence (AI) has transformed English language education, particularly in enhancing the creativity of pre-service English language education students when developing teaching modules and student assignments. With the advent of generative AI (GenAI), these students can produce innovative content, including tailored lesson ideas, making the teaching process more dynamic. Research shows that such AI-supported practices not only save time but also foster creative thinking, as students learn to integrate technology to design more adaptive and inclusive modules. For example, [Abualrob \(2025\)](#) highlights how pre-service teachers use AI tools such as Copilot to generate lesson plans, instructional media, and authentic assessments, ultimately increasing student engagement and instructional efficiency. In the Indonesian context, AI serves as a catalyst for exploring new ideas ([Hastomo et al., 2025](#); [Putri & Natsir, 2025](#)). [Luaran et al. \(2024\)](#) found that strong technological knowledge enables the effective integration of GenAI for both personal and pedagogical tasks. This aligns with the expanded TPACK framework. However, it is important to consider the possible limitations and risks involved. For instance, over-relying on AI might lead to a lack of human interaction in learning, and there could be concerns about biases in AI algorithms. It is also vital to maintain human oversight to ensure technology complements teaching practices and adheres to ethical standards.

The use of AI among English language education students is increasingly relevant in the digital era, such as ChatGPT. ChatGPT is relevant for developing and creating multimedia-rich teaching modules because it assists teachers generate and refine instructional content which can then be combined with visuals, audio, or other media. By interacting with the tool through prompts, teachers can easily adjust the content to suit different student levels and learning needs. Studies show that students frequently use AI to generate prompts that yield unique content, such as interactive stories for reading practice or simulated dialogues for speaking tasks, thus enhancing creativity in assignment design ([Hwang & Lee, 2025](#); [Spinelli, 2025](#)). [Karaduman \(2025\)](#) revealed that integrating ChatGPT into English language teacher education improves AI literacy and competency, enabling students to develop more innovative modules. Furthermore, these practices contribute to the formation of professional identity, as students learn to balance AI-generated automation with human judgment to ensure authenticity and ethicality in their materials. This trend is reflected in how pre-service teachers utilize AI for lesson planning, as described by ([Kılıçkaya & Kic-Drgas, 2025](#)), who emphasize AI-supported practicum experiences to improve the quality of language instruction. Thus, AI functions not merely as a technological assistance, but a creative partner, encouraging English language education students to experiment with more engaging and effective module design.

The background of this study stems from the rapid development of AI in teacher education, particularly for English language education students who are increasingly expected to create innovative teaching modules. A key point is how AI use can enhance their creativity in developing modules and assignments, such as producing culturally responsive or interactive content for EFL students. According to [Wu et al. \(2025\)](#), factors such as the intentional use of GenAI influence instructional design by enabling students to brainstorm new ideas and structure modules more efficiently. However, without proper guidance, AI use can lead to overreliance, as found in a study on AI literacy among pre-service teachers ([Chung, 2024](#)). In Indonesia context, this topic becomes even more crucial due to unequal access to AI tools, which influences students' ability to integrate technology in microteaching and assignments development. This aligns with the findings by [Sanusi et al. \(2024\)](#), who examined AI perceptions using the theory of planned behavior. The results show that empowering foundational AI knowledge and supportive social environments are key for encouraging pre-service teachers to engage with AI information.

Despite recent advancements, a significant gap in research remains concerning how English language education students utilize AI in developing teaching modules and assignments. Existing studies tend to focus more on general perceptions or AI literacy, rather than on specific practices like creating prompts for innovative content or incorporating AI into adaptive assignment design ([Adigun et al., 2025](#)). Furthermore, much of the current literature highlights theoretical frameworks, such as I-

TPACK, without fully addressing how AI can be practically applied in English language contexts, particularly in generating culturally sensitive materials (Luaran et al., 2024). Additionally, there is limited exploration into how these students use AI to foster creativity, align modules with the Merdeka Belajar curriculum, or engage in self-evaluations of their assignments, despite AI's potential as a tool for inspiration and enhancement (Chen et al., 2025). By synthesizing these limitations, it becomes clear that while theoretical insights abound, there is a need for more practical. This study's contribution lies in its focus on the practical application of AI by English language education students, particularly in the development of teaching modules and assignments. While much of the existing research centers around theoretical frameworks like TPACK, this work takes a different approach by exploring how AI can be used in practice to foster creativity, particularly through prompt-based strategies and ethical integration. This focus is important because it moves beyond theoretical discussions and directly addresses the gap between theory and practice. The study complements TPACK's emphasis on integrating technology, pedagogy, and content knowledge.

Unlike studies that concentrate on perceptions, this research investigates actual practices, such as the use of AI for adaptive content and multimedia, as suggested by Hwang and Lee (2025). The study aims to map students' AI practices by identifying benefits such as time efficiency and improved idea generation, as well as challenges such as output inconsistencies. These findings are expected to inform recommendations for more creative and effective training programs (Dieker et al., 2024). This study offers a valuable contribution by addressing a key gap in AI-driven teacher education, particularly when it comes to designing teaching modules. One of the main challenges in module design is finding the right balance between creativity and practicality, especially in settings where resources are limited. This research encourages students to think more creatively and use AI to design more engaging and effective modules. As educational environments continue to evolve, the need for tools like AI becomes even more pressing, as it can help make lessons more personalized and adaptive. By exploring how AI can be practically applied in teacher education, this study helps fill the gap between technology and teaching, preparing future educators to meet the challenges of a rapidly changing field.

Furthermore, AI practices in English language education can enrich student experiences through real-time feedback and simulations, as discussed by Zhang and Zhang (2024) in the context of digital literacy. Abualrob's (2025) research shows that AI helps create instruction that actively engages students, despite the potential risk of dependency. Furthermore, AI training interventions can boost student confidence, aligning with findings on GenAI literacy (Karaduman, 2025). This promotes a human-centered approach in which AI serves as a tool for creativity rather than a replacement for human judgment. This study specifically focuses on teaching modules and students' assignments because these components are central to the teaching and learning process, where AI can have a significant impact in boosting pre-service teachers' development. By exploring how AI can improve these areas, the study seeks to provide practical insights into how AI can create more personalized experiences. While the background addresses best practices for AI integration, the research question narrows the focus to the specific ways AI can influence the design of teaching modules and assignments, in line with the quality education goal of preparing pre-service teachers for the challenges of the digital era.

LITERATURE REVIEW

AI in language education and learning planning

The integration of AI in English language education has transformed lesson planning, particularly for pre-service teachers, by encouraging creativity in developing adaptive and innovative teaching modules. AI tools, especially generative systems, enable pre-service English teachers to generate fresh ideas, such as prompts for interactive speaking exercises or culture-based modules, thereby increasing the efficiency and personalization of learning. Studies show that AI helps overcome traditional limitations by enabling pre-service teachers to experiment with multimedia content and diverse student scenarios, ultimately making modules more engaging and creative (Rahmahwati et al., 2025).

In the context of lesson planning, AI has transformed the design process, with pre-service teachers using AI to brainstorm innovative topics and tailor assignments to the needs of EFL students. This not only saves time but also encourages creative thinking, such as integrating gamification or virtual simulations into language modules (Chen et al., 2025).

However, challenges such as over-reliance and ethical issues arise, as AI use may hinder originality if not properly supervised, although its benefits in improving pre-service teachers' digital literacy are well recognized (Karaduman, 2025). Current research highlights the growing trend of AI integration in English language teaching, with tools like ChatGPT supporting the development of creative lesson plans. The technology acceptance model (TAM) has been widely used to explain how users adopt and engage with new technologies, particularly through the concepts of perceived usefulness and perceived ease of use. In educational research, TAM has frequently been applied to examine teachers' and students' acceptance of digital tools, including AI-based technologies (Liu et al., 2025; Şimşek et al., 2025).

Competencies of pre-service English language teachers in developing lesson plans and student assignments

Pre-service EFL teachers play a pivotal role in crafting engaging lesson plans and student assignments that promote language proficiency, cultural sensitivity, and critical thinking. However, many exhibit limited competencies in creative design, often struggling with idea generation, personalization for diverse learner needs, and structural coherence due to inadequate training and low confidence (Karaduman, 2025; Yuan & Stapleton, 2020). In EFL contexts, pre-service teachers use GenAI across multiple stages of lesson planning, including topic selection, activity ideation, material creation, and language refinement. Tools such as ChatGPT and Claude.ai assist in generating age-appropriate, engaging topics and interactive activities that help overcome creative blocks while enabling customization based on learners' proficiency levels and interests (Kerr & Kim, 2025). Similarly, GenAI supports the development of motivational activities and problem-solving tasks, introducing novel ideas that make lessons more interactive and appealing, thereby reducing planning burdens and amplifying innovative thinking (Del Valle, 2025).

Integrating GenAI via structured approaches, such as lesson study or targeted interventions, further enhances creativity. Pre-service language teachers in practicum-based settings use tools like Gemini and DALL-E to create personalized reading passages, vocabulary exercises, and quizzes, viewing AI as an efficient collaborator that saves time and enriches content differentiation (Alreiahi & Alrwaished, 2025). Training that emphasizes an "AI mindset" alongside the use of tools promotes reflective iteration, leading to higher-quality lesson plans with stronger TPACK integration and more creative pedagogical reasoning compared to tool-only instruction (Tran et al., 2025). Moreover, dedicated GenAI literacy programs significantly increase creative application, with pre-service EFL teachers reporting increased idea generation and innovation in lesson designs after training (Huang et al., 2025). Despite these benefits, challenges persist, including overreliance, output inaccuracies, and ethical concerns like plagiarism (Kim, 2024; Zhai et al., 2024). By embedding AI literacy in teacher education, programs can bridge competency gaps and cultivate innovative educators in an AI-driven era.

Pre-service teachers' intentional use of AI in instructional design

Previous research has examined pre-service English language teachers' processes and intentional use of AI in instructional design, highlighting how generative tools can enhance creativity in developing tailored teaching modules and student assignments. Wu et al., (2025) developed a grounded theory model identifying four key dimensions influencing pre-service teachers' intention to use generative AI: technical factors, environmental factors, usage characteristics, and psychological factors. Chen et al. (2025), through an empirical ICAP study, demonstrated that generative AI assistance significantly improved instructional design quality and strengthened pre-service teachers' creative capabilities, enabling more dynamic language activities and personalized learning tasks. Additionally, Sanusi et al.

(2024) found that basic AI knowledge and subjective norms were the strongest predictors of pre-service teachers' intention to learn AI, explaining 79% of the variance in behavioral intention and supporting creative integration of AI for culturally sensitive English modules. He identified five themes in pre-service English teachers' AI experiences: exploration of pedagogical potential, shifting attitudes, intentional integration in lesson design, ethical reflections, and evolving self-efficacy.

Several studies highlight the growing perceptions of pre-service English language teachers as users of AI in enhancing their creativity in developing teaching modules and student assignments (Erdem Coşgun, 2025; Karaduman, 2025). These studies emphasize benefits such as time efficiency, idea generation, and personalized content creation, while also noting challenges such as ethical concerns and dependency risks. For instance, pre-service EFL teachers report positive shifts in attitudes toward AI literacy, with tools like ChatGPT supporting lesson planning and fostering innovative, student-centered materials through adaptive prompts and iterative refinements. Practicum experiences similarly reveal intentional AI integration for generating culturally sensitive assignments and quizzes, promoting equitable learning designs that encourage original thinking beyond traditional methods. While AI fosters creativity by enabling exploration of diverse pedagogical possibilities and prompting ethical reflections, gaps remain in understanding how these perceptions directly translate into the development of teaching modules and student assignments. This limited insight into pre-service teachers' views as AI users underscores the need for more targeted research. Therefore, the research question guiding this study is: What are pre-service English teachers' perceptions regarding the use of AI in developing teaching modules and student assignments?

METHOD

Research design

The research design for this study is driven by the need to explore the perception in the integration of AI in the development of teaching modules and student assignments, specifically within the context of English pre-service teachers. This study employed a descriptive quantitative approach using a cross-sectional survey design. This design collects data at a single point in time to provide a quick and efficient snapshot of the current situation without making causal inferences. It is appropriate for clearly describing prospective English teachers' perceptions and experiences in utilizing AI to develop teaching modules and student assignments. A cross-sectional survey was selected because it enables rapid and efficient data collection from a defined population, offering an accurate overview of how prospective English teachers currently use AI in instructional design.

Participants

This study involved forty two participants from three different universities: twenty students from Universitas Muhammadiyah Sidoarjo, ten from Palangka Raya University (Kalimantan), and seven from Brawijaya University. Participants were selected purposively based on the criterion of having taken or currently taking a Micro Teaching course, ensuring that they had direct experience designing learning tools such as teaching modules and student assignments, areas where creativity can be enhanced through AI integration. The information regarding the use of AI in micro teaching contexts was primarily provided by the lecturers of the participating universities. Based on demographic profiles, most respondents were female (73.8%), while the remaining were male (26.2%). In terms of academic level, respondents were predominantly sixth- and eighth-semester students, representing a crucial stage in their preparation to become professional teachers. The Micro Teaching class is particularly important because it provides a controlled teaching simulation in which prospective English teachers can gradually practice and refine their teaching skills, including the development of creative modules with the help of AI.

Data collection

Data were collected through an online questionnaire in the Indonesian language, which was validated through expert judgement before its distribution via Google Form. The questions consist of two types

of questions. First, a closed-ended questionnaire, including single- and multiple-choice items, was used to gather structured quantitative data such as demographic information, frequency of AI use, types of applications used, and perceptions of AI in developing teaching modules. Second, open-ended questions were included to explore respondents' reasons, opinions, and experiences that were not captured by the predefined options.

The instrument was organized into five dimensions to explore perceptions, and data were analyzed descriptively and quantitatively while adhering to ethical standards such as informed consent, confidentiality, and participants' right to withdraw. The framework was adapted from studies promoting creative AI use in pedagogy (Castillo-Cuesta et al., 2025; Reina-Parrado et al., 2025; Chung, 2024; Karaduman, 2025; Sanusi et al., 2024). These studies inspired the development of the present's study instrument by shaping its core dimensions, including creative idea generation, responsible AI use, pedagogical alignment, and AI literacy. For example, research on pre-service teachers' AI perceptions and readiness guided the inclusion of items related to ethical awareness and control, while studies on AI-supported instructional design informed indicators focusing on creativity, lesson planning, and material refinement. The detailed list of questionnaire items is presented in Table 1.

Table 1
Blueprint of the Questions

Dimensions	Indicator	Description	Questions
AI Experience and Frequency of Use	Initial experience with AI tools	Identify whether you have used AI for initial creative idea generation.	1. Have you ever used AI technology (such as ChatGPT, Grammarly, Quillbot, etc.)?
	Frequency of AI use in instructional design	The level of regularity of using AI for the generation of creative modules on a routine basis	2. How often do you use AI to create or design English teaching modules?
Benefits and Assistance of AI in Instructional Design	Types of AI assistance received	Specific assistance for brainstorming topic ideas and compiling creative content	3. What type of assistance do you most often receive from AI in creating teaching modules? (You can choose more than one)
	Overall benefits of AI	Impact on time savings, quality improvement, and confidence for creative student assignment design	4. AI helps you in the following (you can choose more than one):
Challenges to AI Use	Key challenges in AI integration	Challenges such as plagiarism, output quality, and dependencies that affect the originality of the module	5. What are the main challenges you face when using AI in creating teaching modules?
AI Tools Preferences and Needs	AI tools used	Tools preferences for content generation and creative layout design	6. What AI applications or platforms have you used to develop English language teaching modules?
	Most frequently used AI tools	Frequency of use of specific tools for innovative English modules	7. From the following list, which AI application do you use most often to develop teaching modules?
	Priority AI feature needs	Features needed such as adaptive customization for creative student assignments	8. In your opinion, which AI is most needed to help prospective teachers develop English language teaching modules? (Choose a maximum of 3)
AI Usage Recommendations	Guidelines for the use of AI in teacher training	Curriculum monitoring and integration strategies for teacher creativity	9. In your opinion, how should the use of AI be directed in the education of prospective English teachers?
	Guidelines for using AI for student assignments	Ethical boundaries and training to maintain the originality of the task	10. In your opinion, how should the use of AI be directed in the context of student assignments?

Data analysis

Data analysis in this study utilized quantitative data obtained from closed-ended and open-ended survey questions, which were examined using descriptive statistical techniques. Descriptive statistics were selected because this research was intended to give an overall picture of how EFL pre-service teachers use AI, rather than to test specific hypotheses or draw causal conclusions. For this purpose, presenting the data through frequencies and percentages was enough to clearly show the main trends and practices shared by the participants. Frequency counts and percentage distributions were calculated to provide a clear overview of respondents' selections across the response categories. This approach enabled the researchers to map patterns within the dataset, identify dominant tendencies, and observe variations among respondent groups.

The findings were triangulated by integrating closed-ended survey data and open-ended responses collected from the same participants. In this study, closed-ended questions were presented in a multiple-choice format, allowing participants to select predefined options that directly represented their views, which minimized the risk of misinterpretation and made member checking unnecessary for this part of the data. Member checking was therefore applied only to the open-ended responses, where interpretation was involved through thematic grouping.

FINDINGS

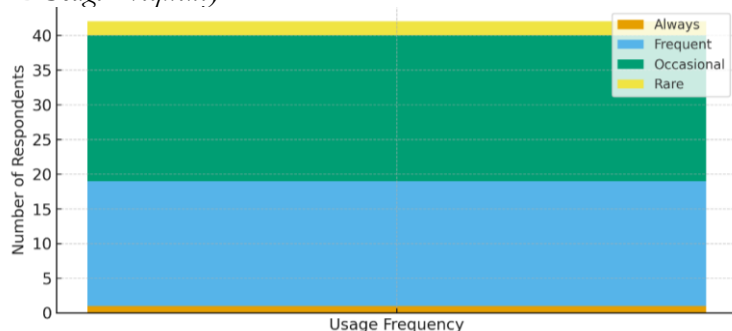
The survey provided detailed quantitative insights into the perceptions of AI utilization among the 42 pre-service English language teachers from three Indonesian universities. The following subsections present the key findings, organized thematically for clarity, with descriptive statistics derived from frequency distributions and percentages.

AI usage frequency

AI adoption for module and assignment development was notably high, with 95% of participants ($n = 40$) reporting at least occasional use, indicating widespread yet cautious integration that supports selective creative applications such as brainstorming and tailored language activities. Occasional use was the most common at 50% ($n = 21$), followed by frequent use at 43% ($n = 18$), rare use at 5% ($n = 2$), and consistent use ('always') at 2% ($n = 1$). Treating this data as an ordinal scale (1 = rare, 2 = occasional, 3 = frequent, 4 = always), the mean frequency was 2.43 ($SD = 0.62$), reflecting low variability and suggesting a transitional phase in which pre-service teachers leverage AI for creative support without overreliance. The summary of the results is presented in [Figure 1](#).

Figure 1

AI Usage Frequency



The data presented in [Figure 1](#) shows that the EFL pre-service teachers have a high level of AI engagement, with the vast majority using AI at least occasionally. Most users fall in the “occasional” and “frequent” options, suggesting good acceptance of AI but with a level of caution rather. Only a very small minority rarely or never use AI. To sum up, the findings reflect a trend toward growing adoption of AI tools while maintaining moderate, controlled usage practices.

Commonly used AI tools

Participants favored versatile tools that enhance creative workflows, with ChatGPT leading at 76% ($n = 32$) for generative tasks such as module outlining. Other frequently used tools included DeepL (57%, $n = 24$) for translation-enhanced content, Canva (43%, $n = 18$) for creative visual layout, Grammarly (33%, $n = 14$) for writing refinement, Quillbot (26%, $n = 11$) for paraphrasing ideas, and Google Translate (17%, $n = 7$) for multilingual adaptations. This multi-tool approach (sum $>100\%$ due to multiple responses) underscores AI's role in diversifying creative processes in English module development. To see the range of AI tools used by the pre-service teachers, Figure 2 gives the illustration.

Figure 2

Commonly Used AI Tools

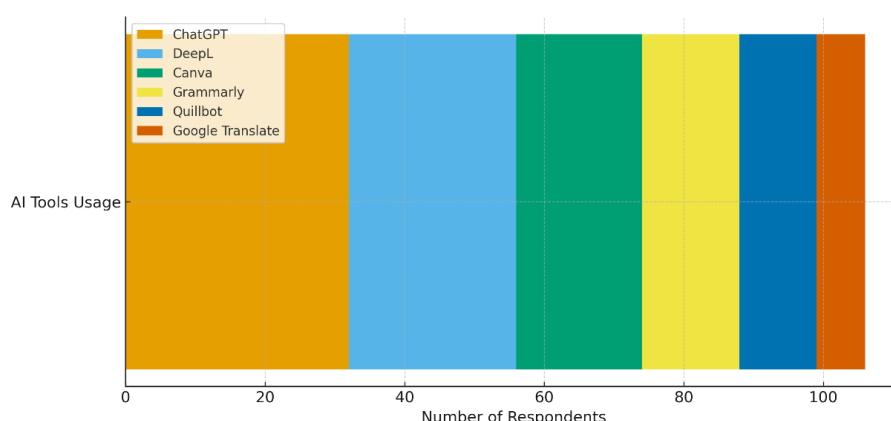
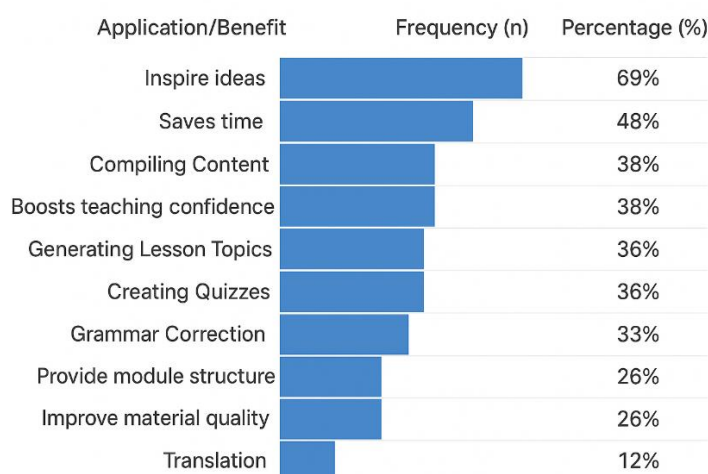


Figure 2 shows that pre-service teachers strongly prefer generative AI tools, especially ChatGPT. Translation and writing-support tools (DeepL, Grammarly, Quillbot) are also used but to a lesser extent. Google Translate is the least used, indicating a shift toward more advanced AI-powered tools. Overall, the visualization highlights a clear trend: ChatGPT dominates AI use, while other tools support more specific tasks.

Key applications and benefits

AI was applied primarily for core creative tasks: compiling content (38%, $n = 16$), generating lesson topics (36%, $n = 15$), producing quizzes (36%, $n = 15$), grammar correction (33%, $n = 14$), and translation (12%, $n = 5$). These multiple-response results demonstrate AI's utility in fostering innovative English pedagogy, such as creating culturally responsive quizzes and activities. The perceived benefits further supported creativity. AI served as a source of inspiration for 69% of participants ($n = 29$), saved time for 48% ($n = 20$), provided structural guidance and improved quality for 26% ($n = 11$) each, and boosted confidence for 12% ($n = 5$). These results illustrate AI as a time-efficient creative partner, enabling pre-service teachers to focus on producing original, high-quality teaching modules in resource-limited settings, as illustrated in Figure 3.

Figure 3*AI Key Applications and Benefits for Pre-service Teachers*

The result in Figure 3 shows a distinct trend in how pre-service teachers arrange AI applications, with the highest usage concentrated on inspiring ideas. This is followed by substantial reliance on AI to save time, underscoring its function as an efficient tool that restructures content preparation. Moderate use of AI—such as for compiling content and boosting teaching confidence, generating lesson topics and creating quizzes, grammar correction, and constructing or improving materials. Notably, translation emerges as the least utilized feature. This general pattern suggests that AI is involved less for linguistic purposes and more as a partner for creativity, productivity, and instructional design.

Challenges and concerns

Challenges tempered the overall enthusiasm for AI use, with plagiarism concerns reported by 55% of participants ($n = 23$), inconsistent output quality by 43% ($n = 18$), excessive dependency by 38% ($n = 16$), and difficulty understanding AI-generated results by 14% ($n = 6$). One open-ended response highlighted cascading inconsistencies in prompts and the need for stronger personal mastery, highlighting barriers to developing creative trust in AI tools. The challenges and concerns related to AI use among English pre-service teachers are presented in Table 2.

Table 2*Challenges and Concerns of AI in the Context of English Pre-service Teachers*

Challenge	Frequency (n)	Percentage (%)
Plagiarism concern	23	50%
Inconsistent output quality	18	43%
Excessive dependency	16	38%
Difficulty understanding results	6	14%

Table 2 reveals several notable trends regarding the challenges and concerns experienced by English pre-service teachers when using AI tools. The most prominent concern is plagiarism, suggesting that half of the respondents worry that AI-generated content may compromise originality, academic integrity, or students' own writing development. This is followed by inconsistent output quality, indicating that many pre-service teachers encounter variability in the accuracy, relevance, and reliability of AI responses, which can hinder smooth lesson planning. The concern of excessive dependency also appears significant, reflecting apprehension that frequent AI use might reduce students' or teachers' critical thinking and independent problem-solving skills. Meanwhile, the lowest concern, difficulty understanding results, suggests that only a small portion of pre-service teachers

struggle to interpret or make sense of AI outputs, implying that most users feel technically capable of navigating and understanding AI-generated information.

Desired AI features

Future-oriented preferences focused on student-centric enhancements: adaptive customization at 50% (n = 21), content compilation at 45% (n = 19), layout design at 29% (n = 12), quiz generation and grammar correction both at 24% (n = 10 each), and translation at 17% (n = 7). These demands (up to three selections per respondent) indicate a growing demand for AI tools that enhance creativity through personalization, making them well-suited for developing dynamic English modules as presented in [Table 3](#).

Table 3

Desired AI Features

Desired Feature	Frequency (n)	Percentage (%)
Adaptive content customization	21	50%
Content Compilation	19	45%
Layout Design	12	29%
Quiz Generation	10	24%
Grammar Correction	10	24%
Language Translation	7	17%

The data shows that when it comes to making teaching modules, English pre-service teachers seem to select AI that can customize content, which makes sense given the need to create flexible and personalized materials that can meet the varied student needs. Many participants also appreciate AI's ability to quickly gather and organize information, which is crucial when teachers are under deadlines. The interest in layout design highlights the importance of creating teaching modules that are not only informative but also visually engaging and well-structured. While tools like quiz generators and grammar checkers are still valued, they are seen as less of a priority, likely because teachers can handle these tasks manually. Language translation, on the other hand, is rated the lowest, likely because most teachers write their lesson plans in either English or Indonesian, making translation tools less essential in this context. To sum up, these preferences reflect the real-use challenges teachers face in balancing creativity, efficiency, and the demands of diverse classrooms.

Recommendations for directing AI usage

Recommendations emphasized ethical, creativity-oriented AI use. For teacher training, respondents supported supervised use at 60% (n = 25), optimization for creativity and efficiency at 38% (n = 16), limiting dependency at 36% (n = 15), and curriculum integration at 12% (n = 5). For student assignments, most recommended restricting AI to idea generation or references only at 67% (n = 28), followed by ethics training at 43% (n = 18), limited or supervised use at 33% (n = 14), and complete prohibition at 7% (n = 3). These findings (with multiple selections allowed) underscore the need for structured guidelines that maintain academic integrity while maximizing AI's supportive role in fostering creative and equitable module design, as depicted in [Table 4](#).

Table 4

Recommendations for Directing AI Usage by English Pre-service Teachers

Category	Recommendation	Frequency (n)	Percentage (%)
Teacher Training	Supervised use	25	60%
	Optimize creativity/efficiency	16	38%
	Limit dependency	15	36%
	Curriculum Integration	5	12%
Student Assignments	Restrict to ideas/references	28	67%
	Ethic training	18	43%
	Allow with supervision	14	33%
	Ban	3	7%

In this recent study, pre-service teachers generally agree on the integration of Artificial Intelligence (AI) into English as a foreign language (EFL) teaching practice; however, their agreement is conditional and anchored in the need for controlled, ethical, and pedagogically guided use, which refers to responsible use of AI as assistance in the education context. They perceive it as a supporting tool that must be embedded within sound pedagogical principles. This indicates a rising awareness among future EFL teachers that AI can supplement language learning when applied strategically, yet it can also challenge essential learning processes if misrepresented or left unsupervised.

The recommendations suggest a balanced use of AI in English teaching. Pre-service teachers can strengthen their skills to use AI in boosting creativity, come up with new teaching ideas, and plan lessons more efficiently. This is important for teachers to develop diverse materials and ideas to make communicative language teaching effective and suited to their students' needs. At the same time, the importance of supervision and the limitation of AI dependence proves an understanding that language learning requires active cognitive engagement. Overreliance on AI-generated language may diminish students' opportunities for authentic practice, interaction, and output—key components of effective EFL pedagogy.

Additionally, their strong preference for limiting AI use in student assignments to idea generation or references shows acknowledgment of the importance of maintaining academic integrity and ensuring that learners produce their own language. This aligns with EFL principles that stress the need for students to engage in meaningful tasks, construct their own sentences, and grow linguistic autonomy. Their call for ethics training also links directly to responsible digital citizenship, now an essential component of preparing learners to navigate online language resources safely and critically.

DISCUSSION

The main findings of this study are that most pre-service teachers use AI occasionally or frequently to support their creativity in developing teaching modules. This aligns with the technology acceptance model (TAM). TAM explains that perceived ease of use and self-efficacy encourage gradual adoption of new technologies (Liu, 2011). This balanced pattern differs from global studies reporting more consistent AI use. This temporary use could be due to factors like limited knowledge of AI tools, lack of training, or concerns about reliability and ethics (Dakakni & Safa, 2023; Swidan et al., 2025). The findings imply that pre-service teachers use AI into the process of teaching module development, but its use is not yet consistent, reflecting the benefits and challenges of AI. The findings highlight the significance of addressing gaps in AI literacy, supporting with professional training, and alleviating focus on AI's ethical rules.

In Indonesian EFL contexts, it reflects a unique developmental stage shaped by limited AI proficiency, leading to careful yet purposeful engagement (Karaduman, 2025). Similar findings in other research note uneven usage despite awareness and recommend guided, scaffolded approaches to transform sporadic AI experimentation into focused creative application, such as generating adaptive quizzes for diverse learners (Bilbao-Eraña & Arroyo-Sagasta, 2025). For enhancing module creativity, these insights underscore the need to integrate AI more systematically into Micro Teaching courses to support smart instructional design. Such integration can help pre-service teachers develop fresh EFL lessons that blend technological support with personal pedagogical insight (Hsu et al., 2024).

Theoretically, these patterns align with Vygotsky's zone of proximal development (ZPD), where AI functions as a scaffold that supports idea generation. Pre-service teachers may begin with AI-generated prompts during the brainstorming phase and then refine the content manually, allowing them to gradually strengthen their instructional design skills. Recent empirical studies involving Slovak EFL pre-service teachers echo this developmental pattern. Despite adequate awareness, implementation remains inconsistent, and scholars recommend scaffolded interventions to shift incidental AI use toward deliberate creativity, such as prompting AI to generate adaptive assessment tasks for learners with varying proficiency levels (Bilbao-Eraña & Arroyo-Sagasta, 2025). Embedding AI literacy within Micro Teaching curricula would therefore promote selective experimentation, allowing pre-service teachers to craft original EFL scenarios that synergize AI-generated ideas with

human judgment (Hsu et al., 2024). In other words, participants in this study are at a stage where they can create innovative teaching modules, but they still require some guidance and support to refine their designs. The use of AI acts as a form of scaffolding, helping them expand their abilities within their ZPD. As they become more confident, they may gradually be able to create these modules independently.

The focus on adaptive content customization as a top desired AI feature links to adaptive personalization theory (Graf, 2023), which highlights AI's ability to adjust content to individual learner's profiles and enhance engagement. This finding goes beyond basic AI advantages such as efficiency, revealing a specific need in EFL contexts for tools that tailor modules to students' proficiency levels and cultural backgrounds (Castillo-Cuesta et al., 2025). It is also consistent with cognitive load theory (Sweller, 2024), in which AI reduces mental strain by simplifying complex tasks, as demonstrated in e-learning systems that support teachers in developing creative instructional skills. In EFL teacher training from 2020–2025, this trend reinforces the TPACK framework by combining technological proficiency with pedagogical adaptability, similar to research showing how AI assists in personalizing language learning tasks (Chen & Chen, 2009; Hwang & Lee, 2025).

Previous studies are in line with this study's finding on AI's inconsistencies, like spreading prompt errors (inconsistent quality), by showing how simple prompt changes can help teachers build GenAI skills. These works treat errors as valuable learning moments, offering practical tips for specialized training that transforms rough AI outputs into effective teaching resources (Celik et al., 2025; Chen et al., 2025; Ko et al., 2025). This directly relates to the study's result where one respondent highlighted "inconsistent results affecting subsequent prompts," emphasizing the need for human fixes to avoid cascading issues. To boost module creativity, this suggests organizing hands-on workshops focused on teaching-related prompting, guiding pre-service teachers to fix inconsistent AI outputs and create new EFL modules, such as improved grammar tasks, making the process more original and adaptable to classroom needs.

In pedagogical theory, this challenge connects to the ICAP framework (Interactive, Constructive, Active, Passive), where AI-related problems encourage active rethinking: teachers must rework outputs rather than copy them uncritically (Zheng & Chen, 2025). Studies on Slovak EFL pre-service teachers mirror this study's result on difficulty understanding AI outputs, revealing uneven use of AI even among teachers who are familiar with it, and recommending step-by-step support to shift random attempts into targeted creativity, such as building quizzes that adapt to different learners (Bilbao-Eraña & Arroyo-Sagasta, 2025). To strengthen module creativity, this implies incorporating AI practice into Micro Teaching courses for guided experimentation, helping teachers produce unique EFL lessons that blend technology with their own ideas (Hsu et al., 2024). This approach enables pre-service teachers to design innovative modules, for example, beginning with AI-generated culturally relevant activities and adding personal refinements for genuine originality, aligning with the study's call for personal mastery to overcome inconsistencies. The findings of this research suggest that the pre-service teachers position AI references, which encourage active engagement but can slip into passive use when AI outputs are taken with minimal processing.

The balanced suggestions for supervised AI use and restrictions refine existing calls for AI literacy by stressing supervision and ethics in EFL contexts (Sanusi et al., 2024). This finding adds a new focus on tailored rules, moving beyond basic skills to ensure safe creativity without unnecessary risks, matching the study's push for digital ethics training. Promoting supervised GenAI for teacher growth, like in hands-on lesson planning that mixes new ideas with honesty is supported by Kılıçkaya & Kic-Drgas (2025) and Tran et al. (2025). For boosting module creativity, this means setting up guided group sessions with mentors, where pre-service teachers mix AI ideas with ethics to create fair, fresh lessons, such as activities that fit different cultures. Recent work on EFL training echoes the study's call for limits, recommending policy changes for mentored AI use that keep innovation alive while being fair (Uysal & Yüksel, 2024; Han, 2025). To enhance module creativity, this research suggests incorporating structured rules into teacher education for supervised practice, enabling pre-service teachers to collaborate on assignments that blend AI sparks with personal ethics. As a result,

teachers can make innovative modules, like starting with AI for culturally fitting activities and adding personal tweaks for true originality, aligning with the study's emphasis on ethical oversight for equitable AI-enhanced classrooms.

CONCLUSION

This study illuminates EFL pre-service teachers' perceptions of AI in developing teaching modules and student assignments. High usage rates highlight AI's strengths in idea generation, time efficiency, and material refinement, while concerns such as plagiarism and dependency indicate important perceptual challenges. Preferences for supervised integration and ethical training underscore the need for balanced strategies that promote originality, critical thinking, and responsible use. By addressing these perceptions, educational stakeholders can maximize AI's benefits while minimizing risks. This study offers context-specific information that extends current discussions on AI-supported teacher preparation. Due to its reliance on self-reported survey data in a single national context, this study recommends future research to explore the topic by using mixed-method approaches with more participants from other countries. Furthermore, it would be meaningful for future research to investigate how AI can be integrated with Islamic values in fostering pre-service teachers' character development and ethical reasoning.

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