

# Teacher Education Students' Perceptions of ChatGPT for Lesson Planning: Benefits, Challenges, and Use

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**Abstract:** This study explores teacher education students' perceptions of using ChatGPT for lesson planning and its potential impact on K-12 education. Employing a mixed-methods approach, 76 graduate students, primarily practicing K-12 teachers, participated in pre- and post-surveys. The quantitative findings revealed significant improvements in participants' perceived efficiency and effectiveness in lesson planning with ChatGPT, especially for generating engaging activities, crafting questions, and enhancing productivity. However, some challenges were identified, particularly in using AI to manage classroom dynamics, foster student independence, and encourage critical thinking. Qualitative data also raised concerns about reliance on AI, academic integrity, the accuracy of ChatGPT's responses, and the risk of reduced critical engagement among students. To address these challenges, participants recommended implementing policies for responsible use, providing training on ChatGPT's limitations, and structuring its integration into curricula with a focus on ethical considerations. The study concludes that while ChatGPT holds promise as a tool for lesson planning, its application in K-12 settings should be thoughtfully regulated to maximize educational benefits and minimize potential drawbacks.

**Keywords:** ChatGPT, lesson planning, teacher perceptions, AI in education, teacher education.

## Introduction

Artificial Intelligence (AI)- powered platforms have the potential to significantly impact education by enabling personalized learning experiences (Khan et al., 2023; Luan et al., 2023) and streamlining assessment processes (Robert, 2024). For example, a tool like DreamBox Learning offers personalized math exercises for a student like Albert, who excels in reading but struggles with math. This tool offers personalized math exercises for Albert, adjusting in real-time to his progress and providing immediate, human-like feedback. According to Meyer et al.'s study (2024), this AI-generated feedback can help improve his performance and increase his motivation and positive emotions.

The rapid advancements in AI have also led to the development of large language models (LLMs) that power chatbot applications. One example is ChatGPT, created by OpenAI, which can engage in human-like conversations (OpenAI, 2023a; Rudolph et al., 2023). However, it is essential to acknowledge AI's limitations and potential threats to ensure its effective and responsible use in educational settings (Biddle, 2022; Piantadosi, 2022). For example, although advanced, LLMs may occasionally provide inaccurate or misleading information, such as invalid references (King & ChatGPT, 2023), biased content, and limited knowledge of world events (Rudolph et al., 2023). Therefore, teachers and students must verify AI-generated answers and resources with reliable sources to ensure accuracy and appropriateness for their needs (OpenAI, 2023b).

In the summer of 2023, researchers at a public university in the Southeast U.S. revised a graduate course in an Instructional Technology program to integrate AI technology. This update enabled students to develop a unit of study using AI tools, focusing on standards, instructional strategies, and assessments. For example, students could use ChatGPT to draft and refine their unit plans, incorporating AI assistance into their instructional design processes. This study aimed to explore teacher education students' experiences with ChatGPT in lesson planning for K-12 students. The research questions addressed in the study are as follows:

- 1) How do teacher education students perceive the benefits and challenges of using ChatGPT for lesson planning?

- 2) What are their views on K-12 students' use of AI tools like ChatGPT?

## Methods

A mixed-methods research design was employed to analyze quantitative and qualitative data from pre- and post-surveys. The quantitative analysis focused on evaluating differences in participants' responses, while the qualitative analysis of open-ended questions aimed to identify, analyze, and report patterns or themes. Data collection and analysis were conducted concurrently in a single-phase design, emphasizing both methods equally (Creswell & Plano Clark, 2017). The qualitative data included short responses and brief comments, providing additional context to the quantitative findings and exploring various dimensions of learning experiences (Kim, Ruecker, & Kim, 2017).

## Participants

From Summer 2023 to Fall 2023, 76 graduate students from various course sections participated in the study. These students were enrolled in a teacher education program as degree-seeking or certification-only students. Most participants were practicing K-12 teachers.

## Unit Design Project

Students were grouped into teams of two, with each team having members who taught in similar contexts. The teams were required to collaboratively create a unit of study that incorporated standards, instruction, and assessment specifically designed for K-12 students. All teams were required to follow a 12-step process for developing a high-quality unit of study based on the rigorous curriculum design process outlined by Ainsworth and Donovan (2019), as shown in Table 1.

**Table 1**

*12 Steps to produce a quality unit of study*

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| <ol style="list-style-type: none"> <li>1) Choose a Course &gt; Unit of Study</li> <li>2) "Unwrap" the Unit Priority Standards</li> <li>3) Create a Graphic Organizer</li> <li>4) Decide the Big Ideas and Essential Questions</li> <li>5) Create the Unit Post-Assessment</li> <li>6) Create the Unit Pre-Assessment</li> <li>7) Identify Additional Vocabulary Terms, Interdisciplinary Connections, and 21st Century Learning Skills.</li> <li>8) Plan Engaging Learning Experiences</li> <li>9) Gather Resource Materials</li> <li>10) Select High-Impact Instructional Strategies</li> <li>11) Detail the Unit Planning Organizer</li> <li>12) Reflections</li> </ol> |
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## ChatGPT Activity

Students first reviewed two resources: a free webinar titled "*What is ChatGPT & How is it Used in Education?*" hosted by AECT divisions, which provides a foundational understanding of ChatGPT, and a beginner's guide to using ChatGPT for teacher tasks, including how to design effective prompts. Then, students were expected to use ChatGPT to assist in completing various teaching-related tasks across 12 steps to develop their unit of study.

This included drafting and refining unit instructions, instructional strategies, and assessment plans with the help of ChatGPT.

### Survey Questionnaires

The pre-study survey consisted of knowledge questions (7 items) and perception questions (25 items) regarding ChatGPT. The post-study survey included the same knowledge and perception questions and an open-ended question to collect thoughts on student use of ChatGPT.

### Findings and Discussions

The t-test results for survey questions (SQ) 1-32 were analyzed to identify statistically significant differences in perceptions before and after using ChatGPT. The open-ended responses (SQ33) were analyzed thematically, revealing three main themes: benefits of ChatGPT for students, concerns about its use, and suggestions for improvement. This report summarizes findings related to students' views on the knowledge, benefits, and challenges of ChatGPT in lesson planning and their perceptions of its use in K-12 educational contexts.

#### Knowledge Growth

The results from SQ 1 to 7 indicate that participants experienced moderate knowledge growth in understanding the functionalities of ChatGPT, especially in its role as an educational tool. They became more confident in ChatGPT's ability to generate human-like (SQ1) and multiple formats (SQ3) to draft lesson plans. However, knowledge about its limitations, such as information retention (SQ4), remained unchanged. This suggests that the study increased participants' understanding of ChatGPT's potential benefits, though certain limitations remained consistently recognized.

#### Benefits of Using ChatGPT for Lesson Planning

Teacher education students reported a significant improvement in their perceptions of the benefits of using ChatGPT for lesson planning:

- Crafting Good Questions for Students (SQ12): The mean score increased from 5.35 to 6.18 ( $t = -4.17$ ,  $p < 0.05$ ), indicating increased confidence in using ChatGPT to create effective questions.
- Assisting in Teaching Tasks (SQ20): The mean score increased from 2.28 to 6.16 ( $t = -12.24$ ,  $p < 0.05$ ), showing substantial growth in perceived usefulness.
- Designing Learning Activities (SQ21): The mean increased from 1.96 to 6.05 ( $t = -14.14$ ,  $p < 0.05$ ), indicating improved confidence in designing learning activities using ChatGPT.
- Efficiency, Effectiveness, and Productivity: Survey questions on efficiency, ease of use, and productivity showed significant increases: SQ22 (Enable accomplishing tasks more quickly): Mean increased from 3.89 to 6.30 ( $t = -9.45$ ,  $p < 0.05$ ); SQ23 (Enhance effectiveness on the job): Mean increased from 3.70 to 6.05 ( $t = -9.18$ ,  $p < 0.05$ ); SQ24 (Make it easier to do my job): Mean increased from 3.73 to 6.16 ( $t = -9.61$ ,  $p < 0.05$ ); SQ25 (Increase productivity): Mean increased from 3.76 to 6.16 ( $t = -9.52$ ,  $p < 0.05$ ); SQ29 (Find ChatGPT easy to use): Mean increased from 3.87 to 6.07 ( $t = -8.75$ ,  $p < 0.05$ ); SQ31 (Like the idea of using ChatGPT): Mean increased from 4.04 to 5.87 ( $t = -5.93$ ,  $p < 0.05$ ).

#### Challenges of Using ChatGPT for Lesson Planning

Despite some benefits, teacher education students expressed the following challenges regarding the practical application of ChatGPT in classroom environments:

- Controlling Disruptive Behavior (SQ8): The mean score decreased from 5.85 to 3.31 ( $t = 7.48$ ,  $p < 0.05$ ), suggesting that participants found it challenging to manage classroom disruptions effectively using ChatGPT.

- Getting Children to Follow Classroom Rules (SQ13): The mean decreased from 5.75 to 3.52 ( $t = 6.90$ ,  $p < 0.05$ ), indicating challenges in using ChatGPT for enforcing rules in a classroom setting.
- Calming Disruptive Students (SQ14): The mean also decreased significantly from 5.66 to 3.34 ( $t = 7.17$ ,  $p < 0.05$ ), highlighting the limitations of ChatGPT in managing real-time behavior challenges.
- Establishing Classroom Management Systems (SQ15): The mean decreased from 5.75 to 4.51 ( $t = 3.99$ ,  $p < 0.05$ ), indicating difficulties in using ChatGPT to set up effective classroom management systems.
- Getting Students to Believe in Themselves (SQ10): The mean score decreased from 5.68 to 4.57 ( $t = 3.60$ ,  $p < 0.05$ ), suggesting challenges in using ChatGPT to foster students' self-belief.
- Helping Students Value Learning (SQ11): The mean decreased from 5.61 to 4.61 ( $t = 3.54$ ,  $p < 0.05$ ), indicating that ChatGPT may have limitations in helping students appreciate the value of learning.

## Views on K-12 Students' Use of AI Tools like ChatGPT

### *Perceived Benefits of ChatGPT*

A number of respondents highlighted the benefits of using ChatGPT in educational settings, especially regarding its potential to support and enhance learning. One participant (ID 3) described how ChatGPT could benefit students who struggle with understanding complex concepts by simplifying them: *"I believe it can benefit students who struggle to grasp concepts by providing explanations in simpler terms."* This sentiment was echoed by several respondents, suggesting that ChatGPT can serve as an accessible resource to help students with challenging material. In addition, another participant (ID 4) emphasized that ChatGPT can also foster critical thinking by encouraging students to ask more effective questions, stating, *"It can help students think critically by encouraging them to ask better questions."* This indicates that some respondents see ChatGPT as a tool that, when used correctly, can enhance students' inquiry skills and encourage deeper engagement with learning material. Furthermore, ChatGPT's capacity to provide immediate feedback was another benefit noted by respondents. One participant (ID 8) pointed out, *"ChatGPT provides instant feedback on students' queries, allowing them to correct mistakes and understand concepts in real-time."* This immediate feedback was seen as an essential feature in helping students reinforce their understanding of material without delays. Several respondents also emphasized the importance of preparing students for the future by introducing AI tools like ChatGPT into the curriculum. As one participant (ID 9) put it, *"AI is in our future, so we need to educate students on its use in order to prepare them for their future."* This reflects a forward-looking perspective, recognizing that AI will be crucial to the educational and professional landscapes students will navigate.

### *Concerns About ChatGPT's Use in Education*

Despite recognizing the benefits of ChatGPT, many respondents also expressed concerns, particularly regarding over-reliance on the tool and its potential impact on students' critical thinking. One participant (ID 2) articulated a common problem: *"My main concern is that they might become too dependent on it and stop thinking critically."* This reflects a fear that students may rely too much on ChatGPT to provide answers rather than engaging in independent thinking and problem-solving. Similarly, other participants worried that ChatGPT could allow students to bypass the learning process by giving short-cut answers. For instance, one participant (ID 11) stated, *"My concern with ChatGPT is that students will begin to use it to complete assignments and projects rather than developing their ideas and solutions."* This indicates that some respondents feel that ChatGPT, if not correctly managed, could undermine students' intellectual development by removing the effort required to think critically and creatively. Another concern raised by participants was the accuracy of information provided by ChatGPT. One respondent (ID 5) mentioned, *"I would be worried about the accuracy of information provided. Students may not know when to fact-check or question the answers they get from AI."* This concern suggests that students might over-trust ChatGPT, assuming its outputs are always correct, which could lead to misinformation or misunderstanding if they fail to verify the information. In a similar vein, some participants raised issues related to academic integrity. For example, one respondent (ID 6) expressed concern about the potential for plagiarism, saying, *"I worry about students using it to plagiarize or avoid doing their work."* This reflects a broader anxiety that students may misuse

ChatGPT to complete assignments dishonestly, bypassing the learning process and undermining academic standards.

### ***Suggestions for Improving ChatGPT's Integration in Education***

In response to the concerns raised, many participants offered constructive suggestions for improving ChatGPT's integration into education. Several respondents emphasized the need for clear guidelines and policies around ChatGPT's use. One participant (ID 10) remarked, *"I am interested to know how my administration will approach the use of ChatGPT next school year and what rules and/or regulations they will have on the program."* This reflects the need for structured, school-wide policies that define how ChatGPT should be used in classrooms to ensure it enhances student learning rather than detracts from it. Another suggestion commonly raised by participants was the need for proper education on the responsible use of ChatGPT, both for students and teachers. One respondent (ID 11) stated, *"We need to educate students about how to use AI responsibly. ChatGPT can be a great tool, but students need to be aware of its limitations and how to verify the information it provides."* This recommendation highlights the importance of ensuring students have the critical thinking skills necessary to assess ChatGPT's outputs and use the tool effectively and ethically. Monitoring the use of ChatGPT was another recommendation that emerged from the data. One participant (ID 12) suggested that ChatGPT could be integrated into classrooms as a supplementary resource but warned that teachers should *"monitor its use to ensure that students are not abusing it or relying on it too heavily."* This underscores the importance of teacher oversight in preventing students from becoming overly dependent on AI tools. Finally, some respondents suggested incorporating ChatGPT into the curriculum in a structured way, with one participant (ID 15) noting, *"I think AI tools like ChatGPT should be part of the curriculum, but with a strong emphasis on critical thinking and ethical use."* This highlights the need to teach students how to use ChatGPT critically and ethically engage with it.

### **Conclusion**

The findings from this study indicate that teacher education students generally view ChatGPT as a valuable tool for lesson planning, particularly in generating content, enhancing efficiency, and offering immediate feedback. Nonetheless, concerns were raised regarding potential over-reliance on AI, accuracy, and the risk of diminishing critical thinking skills. Participants suggested establishing clear policies on AI usage in the classroom to mitigate these concerns and providing training on responsible AI practices. While ChatGPT demonstrates significant potential as an educational resource, its integration into K-12 education should be approached cautiously to balance its advantages and inherent risks.

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