

INVESTIGATING THE IMPACT OF CHATGPT IN FACILITATING K-12 PRE-SERVICE TEACHERS' DEVELOPMENT OF INDIVIDUAL TEACHER RESOURCE WEBSITES

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Abstract

With the recent advances and growing potential of generative artificial intelligence (GenAI) in education, schools find it increasingly challenging to manage rapidly evolving GenAI-driven technologies yet impossible to resist riding the AI wave. In July 2025, the U.S. Department of Education issued official guidance on the use of artificial intelligence in U.S. schools. Teacher education stands at the forefront of this transformation, playing a vital role in preparing K–12 pre-service teachers with essential GenAI knowledge, skills, and competencies. ChatGPT, one of the most widely used GenAI tools, offers a promising platform for meeting these training needs. This study investigates whether the use of ChatGPT can facilitate K–12 pre-service teachers' ability to develop individual teacher resource websites and foster more positive attitudes toward AI integration in teaching. Participants will include pre-service teachers enrolled in an undergraduate Educational Technology course at an urban public university in the Midwestern United States. Over a twelve-week period, participants will engage in two phases: a baseline phase using traditional methods and an intervention phase incorporating ChatGPT to develop individual teacher resource websites. The findings are expected to offer insights into how ChatGPT can facilitate the development of practical teacher resource websites and contribute to the design of effective, AI-supported instructional materials and activities.

Keywords: *Generative Artificial Intelligence, GenAI, ChatGPT, K–12 pre-service teachers, teacher resource website.*

1. Introduction

Artificial intelligence (AI) has rapidly and profoundly permeated modern society, ushering in what the author of the present study refers to as the “AI-age”. This transformation has created new demands on the workforce, requiring graduates to possess AI-related knowledge and competencies. Consequently, K–12 school curricula must be updated, redesigned, or reimagined to cultivate AI literacy that aligns with workforce and societal needs. Although schools increasingly recognize the urgency of this transformation, they often face challenges related to curriculum development, teacher preparation, and policy guidance.

In response to this national priority, the U.S. government has launched several initiatives. In April 2025, President Trump issued an Executive Order to advance AI education for American youth (White House, 2025). This was followed by a U.S. Department of Education supplemental priority emphasizing responsible AI use, increased classroom efficiency, reduced administrative workload, and enhanced teacher training and evaluation (U.S. Department of Education, 2025a; 2025b). Aligning with these federal efforts, the author's state requires its Department of Education to issue a model AI policy for K–12 schools by December 31, 2025, with school districts mandated to adopt either the state model or a locally aligned policy by July 1, 2026 (GovTech, 2025).

At the forefront of this transformation, pre-service teacher education plays a key role in preparing future educators to meet evolving instructional and technological demands, making AI skills a core component of teacher preparation. Among AI tools, ChatGPT (OpenAI, 2023), released on November 30, 2022, has been widely adopted for instructional planning, content development, and resource curation, and may support pre-service teachers in creating individual teacher resource websites.

2. Literature review

Based on a review of 18 studies, Fernández Cerero et al. (2025) reported that ChatGPT supports teacher professional development, reduces administrative workload, enhances personalized learning, and aids in creating and updating instructional materials. However, challenges include technology dependency, potential impacts on critical thinking, and ethical concerns such as plagiarism. The authors highlighted the need for further research and targeted teacher training to ensure responsible and effective classroom use.

In a year-long experimental study, Guo, Li, and Cunningham (2025) found that students viewed ChatGPT as a user-friendly and effective learning support tool that increased engagement, confidence, and motivation, and complemented classroom instruction. Students also perceived it as promoting equitable access to learning support and expressed interest in continued use. However, the study identified limitations, including occasional inaccuracies, the need for ongoing oversight, and student overreliance, leading the authors to recommend using ChatGPT alongside diverse pedagogical approaches to enhance learning outcomes.

Through an analysis of 40 peer-reviewed studies, Munaye et al. (2025) reported that ChatGPT demonstrates strong potential to support personalized learning and address individual learner needs while enhancing teacher–student interaction. However, they also highlighted concerns related to academic integrity, noting that misuse of ChatGPT for cheating or plagiarism may make it difficult for teachers to distinguish between authentic student engagement and automated assistance. To address these challenges, the authors recommended that teachers integrate AI tools such as ChatGPT into instructional curricula as supportive aids rather than replacements, that policymakers establish comprehensive governance frameworks to ensure equitable and responsible AI adoption, and that researchers prioritize rigorous empirical investigations into the long-term instructional impacts of AI and strategies for reducing bias.

3. The present study

Although prior research suggests promising applications of ChatGPT in educational contexts, its relatively recent introduction has resulted in limited empirical evidence regarding its impact on pre-service teacher practice. In particular, little research has examined the effectiveness of ChatGPT in facilitating K–12 pre-service teachers’ development of individual teacher resource websites. Consequently, empirical investigations of this potential remain scarce. Therefore, the purpose of this study is to investigate the effectiveness of using ChatGPT to support K–12 pre-service teachers in developing individual teacher resource websites. Two research questions guide this study: (1) Does the use of ChatGPT significantly facilitate K–12 pre-service teachers’ development of individual teacher resource websites? (2) What are K–12 pre-service teachers’ perceptions of using ChatGPT to support the development of individual teacher resource websites?

4. Methodology

4.1. Research design

This study employs a quantitative research design to examine the effects of using ChatGPT to facilitate the development of individual teacher resource websites. Over a twelve-week period, all participants will receive the same instructional content delivered online by the same instructor, who has extensive experience in both educational technology and AI integration (e.g., ChatGPT).

The study consists of two phases: a baseline phase using traditional instructional methods and an intervention phase incorporating ChatGPT to support website development.

4.2. Participants

Participants will include a pilot group of 30 K–12 pre-service teachers enrolled in an undergraduate Educational Technology course at an urban public university in the Midwestern United States. All participants will receive instruction on integrating ChatGPT into the development of individual teacher resource websites.

4.3. Instruments

Pre- and post-surveys will be used as the primary data collection instruments. The pre-survey includes demographic items such as licensure program, teaching subject and grade level, gender, ethnicity, prior experience with teacher resource website development, frequency of ChatGPT use, and estimated time spent developing websites with and without ChatGPT. It also includes a scale measuring perceptions of using ChatGPT to facilitate teacher resource website development.

The perception scale consists of 25 items measured on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). The instrument is adapted from Sallam et al. (2023) and modified to focus specifically on teacher resource website development. A sample item is: “I believe that using ChatGPT can save time and effort in facilitating the development of my teacher resource website.” The post-survey mirrors the pre-survey but excludes demographic items.

4.4. Procedures

Participants will complete the pre-survey during the first week and the post-survey during the final week of the study. Throughout the study, participants will submit teacher resource website assignments following standardized instructions. The same instructor will administer all surveys and assignments to ensure instructional consistency.

4.5. Data analysis

Descriptive and inferential statistics will be used to analyze survey data. Paired-sample *t* tests will be conducted to examine differences between pre- and post-survey responses, particularly regarding participants’ attitudes toward using ChatGPT for teacher resource website development. Statistical analyses will be conducted using SPSS, with significance set at $\alpha < .05$.

5. Discussion

Although ChatGPT demonstrates considerable potential in educational contexts, it is not without limitations. The extent to which ChatGPT benefits education depends less on the tool itself than on how teachers and students use it responsibly and effectively.

This study aims to explore how pre-service teachers’ use of ChatGPT as a pedagogical tool can support the development of high-quality teacher resource websites. The findings are expected to enhance knowledge, skills, and competencies in teacher education, particularly for K–12 pre-service teachers, and provide insights into using ChatGPT to design effective teacher resource websites and AI-supported teaching materials and activities.

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