

Research Article

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Generative Artificial Intelligence (GenAI) in Higher Education from Prospective Teachers' Perspectives: A Qualitative Study on Support Opportunities and Usage Challenges

Al-Mothana M. Gasaymeh

Abstract

Background/purpose. Despite the growing use of GenAI tools in higher education, little is known about how female prospective teachers in developing contexts perceive their opportunities and challenges. The current study aimed to examine female prospective teachers' perspectives on the opportunities and challenges of using GenAI in education.

Materials/methods. The study employed a qualitative research design in which 15 students from the College of Education completed a questionnaire comprising open-ended items about their experiences, opinions, and feelings regarding the educational use of GenAI.

Results. The results show that prospective teachers believe that GenAI tools are useful for supporting their learning, their future teaching profession, and their academic confidence. However, they believe that the educational use of GenAI tools was associated with various types of challenges, including technical, psychological, ethical, and social and institutional ones.

Conclusion. The study concluded that GenAI offers significant benefits for supporting prospective teachers' learning, professional preparation, and academic confidence. However, its effective use requires addressing significant technical, psychological, ethical, and institutional challenges. Based on the findings, a set of recommendations for practice and future studies was provided.

1. Introduction

The emergence of GenAI tools, such as OpenAI's ChatGPT, Google's Bard, and Meta's Llama, has marked the beginning of a new age in educational approaches (Akbar, Nyika, & Mbonye, 2024, p.307)

This study aimed to examine female prospective teachers' perspectives on the opportunities and challenges of using GenAI in their learning. GenAI is a type of AI that can autonomously create a variety of new media forms (Lv, 2023). AI has become one of the most widely adopted technologies among individuals, including educators and students. The literature shows various definitions of GenAI:

Generative AI refers to computational techniques capable of generating seemingly novel, meaningful content, such as text, images, or audio, from training data (Feuerriegel, Hartmann, Janiesch, & Zschech, 2024, p. 11).

Generative AI refers to tools that use Large Language Models (LLMs) to produce text, audio, images, or video based on input data, such as a question or prompt (University of Texas at Austin, Center for Teaching & Learning, 2025).

The definition of GenAI reflects its applications in education, where it can be used to generate educational content for educators and students. This content can be in multiple forms, such as text, images, audio, or video. This content can be used to support students' learning and educators' teaching practice. Currently, there are several large language models: ChatGPT, Bard, Bing Chat, and Claude (Obaidoon & Wei, 2024). In the educational context, these models can be used to generate essays, problem sets, lesson plans, feedback, and simulations (Pariyanto & Tungka, 2025). In addition, these models have more capabilities than just generating content. For instance, these models can be integrated with several emerging technologies to accomplish educational tasks such as integrating AI and virtual reality to facilitate immersive learning (Wang & Huang, 2025), integrating AI with gamification to facilitate adaptive educational challenges (Babu & Moorthy, 2024), and integrating AI with translation technology to create speech-to-text, text-to-speech, sign language avatars (Rajabani & Juhana, 2025).

Due to the widespread GenAI tools and their applications in education, as well as the exceptional capabilities of these tools, GenAI tools have started to be viewed as partners in learning rather than as a tool (Liang & Bai, 2025). Therefore, GenAI has been employed by educators to augment students' creativity, empathy, and critical thinking (Rana, Verhoeven, & Sharma, 2025). In addition, they used generative AI to perform repetitive or administrative tasks. GenAI has caused dramatic pedagogical shifts in how educators integrate technologies for educational purposes. Nowadays, the most common theoretical frameworks that underpin the integration of GenAI in education rely on learner-centered approaches, in which GenAI can and should be designed to foster active learning and more personalized learning experiences (Giannakos et al., 2025). Learner-centered approaches that underpin the integration of GenAI in education align with constructivism (Piaget & Elkind, 1968).

The capabilities of GenAI tools and the theoretical frameworks that guide their use in education necessitate shifts in teaching, learning, and assessment in digital contexts. For instance, Pallant, Blijlevens, Campbell, and Jopp (2025) emphasized the design of a course curriculum that employs GenAI tools to scaffold students' learning from basic knowledge construction tasks to more complex knowledge augmentation. In addition, they emphasized designing assessments that promote mastery goal structures, encouraging students to critically engage with GenAI outputs rather than simply reproducing them, fostering optimal learning outcomes. Ilieva, Yankova, Ruseva, and Kabaivanov (2025) proposed a framework for GenAI-supported assessment. The framework outlines how teaching staff can design adaptive and AI-informed tasks and provide feedback, how learners

can engage with these tools transparently, and how institutional bodies can ensure accountability through compliance standards, policies, and reviews. Nguyen, Duong, Nguyen, Lai, and Dang (2025) identified the following factors to consider in learning design: higher-order thinking, transfer of learning, cheating-proof tests, formative assessment, integration into assignments, and integration into pedagogical practices. For assessments, they proposed the following considerations, which focus on four main themes: GenAI-integrated pedagogical dimensions for assessment, accessibility and inclusiveness, a holistic design approach, and ethical obligations and principles.

The shift in teaching, learning, and assessment brought about by the integration of GenAI into education has also dramatically changed teachers' and students' roles in the educational process. For instance, in their paper with the title "Will generative AI replace teachers in higher education? A study of teacher and student perceptions", Chan and Tsi (2024) found that educators should co-exist and partner with GenAI, rather than resist it. Kim (2025) emphasized that teachers should move beyond content delivery toward designing inquiry-rich, consequential learning, using GenAI to deepen their conceptual understanding, elaborate on lesson components, and integrate agency into instruction. Rana, Verhoeven, and Sharma (2025) reported that students should move from passive users to critical evaluators, developing strategies for detecting bias, validating sources, and related tasks. Thus, students' role shifts from mere consumers to active evaluators of AI output. Wang and Fan (2025) argued that when students are embedded in courses that scaffold the use of GenAI, their role shifts to engaging more deeply with concepts and undertaking higher-order cognitive tasks, such as analysis and evaluation.

Nevertheless, given the dramatic transformation in educational pedagogy and practice brought about by GenAI, it is imperative to examine the perspectives of a primary stakeholder in this process: students. The use of GenAI in education has been extensively examined in developed countries (Ogunleye, Zakariyyah, Ajao, Olayinka, & Sharma, 2024). These countries have unique characteristics in terms of the available technological infrastructure and pedagogical cultures. In addition, these countries have institutional policies that differ significantly from those in developing contexts. The findings of these studies on students' use of and perspectives on GenAI have been regarded as the global standard. However, it is essential to conduct context-sensitive investigations that account for variations across developing countries and regions. Yet little is known about how students in general, and female prospective teachers in particular, perceive the opportunities and challenges of GenAI in higher education in developing countries such as Jordan. Understanding and female prospective teachers' perspectives on the opportunities and challenges of GenAI is critical, as teachers' beliefs directly shape the success of GenAI-supported instructional models. Therefore, there remains a clear need for context-sensitive approaches that capture the perceptions of female prospective teachers in Jordan regarding the integration of GenAI in their learning.

Jordan is considered part of the developing world. Jordan is keen to adopt various technologies, including GenAI tools, and to harness their benefits across sectors, including education (Gasaymeh, Beirat, & Abu Qbeita, 2024; Gasaymeh, Abu Qbeita, AlMohtadi, & Beirat, 2025). Such wide interest is evident in national policy and various-level initiatives. For instance, the following paragraph was taken from Jordanian artificial intelligence strategy 2023-2027 in relation to education.

Education development is the cornerstone for building and developing the skills of the next generation and providing society and the labor market with qualitative and qualified competencies by integrating the topics, general applications, and basic skills required by artificial intelligence into school, university, and community college curricula, as well as vocational and technical training programs.

In an example of recent initiative that shows interest in the application of GenAI in education in Jordan, the University of Jordan has launched a research project under the title of: Empowering

Teachers: 21st Century Skills, to strengthen teacher preparation and professional development using artificial intelligence tools, modern pedagogy, and digital skills (Malin, 2025). This program involves collaboration among Jordan's largest public research university, Vanderbilt University in the USA, and the Ministry of Education, to develop a program that integrates AI and digital skills into teacher education, emphasizing critical thinking, creativity, and collaboration to foster an active interdisciplinary research environment (Malin, 2025).

However, the integration of GenAI in education should be complemented by research to promote its adoption, given the importance of its use in the educational process and the novelty of this topic. The current study is significant for developing countries (e.g., Jordan), whose educational systems are striving to integrate GenAI. Therefore, understanding students', especially future teachers', perspectives on GenAI in higher education is essential for supporting educational systems in implementing such tools.

The use of GenAI in education requires changes to teaching methods to prioritize student-centered learning and to integrate advanced technologies, such as AI-powered tools, into the educational process. Therefore, implementing GenAI-based instructional models requires examining students' perceptions of GenAI. Recognizing students' beliefs regarding the integration of GenAI into their education is a critical factor for successful implementation.

1.1. Opportunities and Challenges of GenAI Use in Higher Education

There are numerous prior studies that have identified potential opportunities associated with the application of GenAI in education. Some of these applications are related to providing students with cognitive support. For instance, GenAI can be used to enhance students' knowledge, critical thinking, creativity, and communication abilities (Rahimi, 2025) enhance reading and comprehension abilities (Lai & Wu, 2024), supports students in developing thoughtful inquiries (Schryen, Marrone, & Yang, 2025), help students understand complex problems (Baidoo-Anu, & Ansah, 2023), and help students in exam preparation (McCoy, Ganesan, Rajagopalan, McKell, Niño, & Swaim, 2025). In addition, GenAI can support the development of instructional content for educators and help students process instructional materials. For instance, GenAI can be used to generate topic ideas, summarize large documents, and serve as a research tool (Hanafi, Al-mansi, & Al-Sharif, 2025).

Beyond its capabilities for providing cognitive support and processing instructional materials, GenAI can also offer significant support for teaching. For example, it can function as a virtual teaching assistant (Nyaaba, Shi, Nabang, Zhai, Kyeremeh, Ayoberd, & Akanzire, 2024), facilitate the assessment of student performance, and support automatic grading systems (Foung, Lin, & Chen, 2024). Another important application of GenAI in education is related to language learning and communication skills. GenAI can be used to understand and communicate in multiple languages, conduct text analysis, and support writing development through feedback (Law, 2024).

GenAI tools can also facilitate an active learning environment by creating interactive learning experiences. For instance, they can engage in conversations with students, deliver straightforward responses (Hirata & Hirata, 2025), and assist in preparing debates (Yongzhi, 2024). Furthermore, GenAI contributes to personalized and technology-enhanced learning (Vijayasekaran, Bibiana, Sankeerthana, Soumya, Hema, & Kusuma, 2024). They can be employed to support e-learning and facilitate distance education (Lechhab, Ezzaki, Benammi, Boujarra, Fakhri, & Bourekadi, 2024).

As with the opportunities that GenAI offers in the educational process, it also presents challenges for students, teachers, and administrators alike. Previous studies have shown that there are several challenges. One of these issues is related to academic integrity (Eke, 2023). For instance, students may rely on GenAI to complete assignments and essays; such use of GenAI would make plagiarism detection more difficult and raise questions of fairness. Furthermore, concerns have also been raised

about the reliability of the outputs generated by GenAI tools, as GenAI tools may generate inaccurate, outdated, or biased information (Wei, Kumar, & Zhang, 2025). Occasionally, GenAI tools may produce harmful or misleading content (Arantes, 2024).

Another set of concerns associated with the use of GenAI tools in education relates to ethical and legal issues. Previous studies have reported challenges concerning privacy, data security, and intellectual property associated with the use of GenAI in educational contexts (Ng, Li, Tong, Ye, Yenne, Chandrasekaran, & Li, 2025). Another challenge associated with the use of GenAI tools involves overreliance on these tools, which can undermine students' independent thinking, creativity, and critical evaluation skills (Nguyen, 2025). From a technical standpoint, GenAI has been observed to provide inconsistent responses, and it might misinterpret prompts (Poola, 2023). In addition, scholars emphasize broader risks, such as copyright concerns, inequities in access, and the ongoing need for human oversight to ensure ethical use in education (Lucchi, 2024; Khan & Paliwal, 2023; Mienye & Swart, 2025).

2. Literature Review

Researchers have explored students' perceptions of GenAI use across various subjects and in diverse global contexts. For instance, in a study focused on programming students in Brazil, Silva, Ramos, de Moraes, and dos Santos (2024) introduced the GenAI tool (i.e., ChatGPT) to first-year students and examined its perceived benefits and challenges. The study used a descriptive research design, collecting data from 40 students who had experienced ChatGPT. Results indicated strong agreement that ChatGPT clarified doubts promptly, provided helpful examples, and could assist in identifying errors, while most students rejected the notion that it could replace instructors in programming contexts. At the same time, respondents expressed notable concerns about overreliance, code plagiarism, and potential erosion of independent problem-solving, supporting the need for balanced integration with traditional assessments (e.g., in-person code defenses) and explicit usage guidelines. In another study conducted in Spain, Campillo-Ferrer, López-García, and Miralles-Sánchez (2025) analyzed university students' perceptions of the use of GenAI tools in higher education, focusing on potential benefits and challenges. A mixed method was adopted, and the sample consisted of 407 teacher training students enrolled in the Early Childhood and Primary Education Degrees. The findings showed strong acknowledgment of the importance of GenAI tools for instruction and learning. Students emphasized their ability to support academic tasks, boost motivation, and tailor learning routes. Nonetheless, they also noted challenges related to reliance on technology, ethical considerations, and privacy risks. In Hong Kong, Chan and Hu (2023) explored university students' perceptions of GenAI tools in higher education, focusing on familiarity, their willingness to engage, potential benefits and challenges, and effective integration. A survey of 399 undergraduate and postgraduate students from various disciplines revealed a positive attitude towards GenAI in teaching and learning. Students recognized the potential for personalized learning support, writing and brainstorming assistance, and research and analysis capabilities. However, concerns were also raised about accuracy, privacy, ethical issues, and the impact on personal development, career prospects, and societal values.

In Ukraine, Pavlenko and Syzenko (2024) conducted a study to explore university students' perceptions of using the GenAI tool ChatGPT for learning. The study followed a descriptive research design in which a random sample of 247 undergraduate students from Business, Engineering, and IT programs completed a questionnaire. The results showed that students primarily used ChatGPT to search for information and to perform language-related tasks, such as editing and improving texts. Findings also revealed high levels of satisfaction across all three disciplines, with students reporting positive attitudes toward ChatGPT in supporting assignments and enhancing learning quality.

In Vietnam, Ngo (2023) investigated university students' perceptions of the GenAI tool ChatGPT for learning, using a mixed-methods design that combined an online questionnaire with semi-structured interviews. A random sample of 200 undergraduates who had prior experience with ChatGPT completed the survey, and a subset of 30 students participated in interviews. Findings indicated that students generally viewed ChatGPT favorably and found it easy to use for study purposes. Reported benefits included saving time, accessing information across diverse domains, receiving personalized tutoring and feedback, clarifying theories and concepts, and supporting idea generation and writing. At the same time, students identified notable barriers, including difficulty assessing the quality and reliability of sources, inaccurate or fabricated references, limitations in accurate citation, awkward word substitutions and idiomatic usage, reduced coherence in extended outputs, and challenges with complex mathematical expressions.

In another study on Arabic language learning in Indonesia, Lelepari, Rachmawati, Zani, and Maharjan (2023) conducted a quantitative study to explore the opportunities and challenges of using a GenAI tool, i.e., ChatGPT, in higher-education Arabic language learning. Using a survey design, questionnaires were distributed to university students to gather data on their perceptions. The findings indicated that ChatGPT offered substantial opportunities, including facilitating independent learning, improving reading skills, expanding vocabulary, supporting translation tasks, enhancing motivation, and simplifying assignment completion. Most students reported positive experiences, with strong agreement levels reaching 80%. However, several challenges were also identified, including limitations in human interaction, a lack of cultural understanding, reduced critical thinking, and potential errors in responses.

In Saudi Arabia, Almassaad, Alajlan, and Alebaikan (2024) examined university students' perceptions of GenAI tools. The study employed a descriptive research design, with 859 students completing a questionnaire. The results showed that students used various GenAI tools, including GenAI, Gemini, Socratic, and CoPilot. They used these tools to define or clarify concepts, translate, generate ideas in writing, and summarize academic literature. The participants reported several benefits of such tools, including ease of access, time-saving, and instant feedback. However, they also reported some challenges, including subscription fees, unreliable information, plagiarism, reduced human-to-human interaction, and impacts on learning autonomy.

In another study on the application of GenAI in Health Sciences conducted in Lebanon, Fawaz, El-Malti, Alreshidi, and Kavuran (2025) explored health sciences students' perceptions of the use of GenAI in higher education. A qualitative descriptive research design was employed, with 23 students participating in semi-structured interviews. The interviews revealed both benefits and concerns regarding the use of GenAI in education. Perceived benefits included opportunities for customized, self-paced, and autonomous learning; improvement in language and writing skills; the development of innovative concepts; enhanced efficiency; and greater accuracy of information. Concerns centered on the risk of overreliance on AI, issues of equitable access, and the lack of clear institutional policies.

In Jordan, Gasaymeh, Beirat, and Abu Qbeita (2024) conducted a cross-sectional descriptive study examining undergraduate and graduate students' insights into GenAI writing tools. A total of 95 students participated in the study by completing a questionnaire. Findings indicated a generally moderate level of familiarity, with the strongest for interest and engagement, and the weakest for technical knowledge. In addition, moderate concerns were reported, especially around misinformation, data security and privacy, and ethical use. However, Students highly agreed that GenAI would have a positive effect on their creativity.

The reviewed studies demonstrate that ChatGPT was the most popular GenAI tool among higher education students. These students perceived GenAI tools as both highly beneficial and potentially problematic. The findings suggest that GenAI can serve as a supportive educational tool that

enhances learning by providing immediate clarification, generating instructional materials, facilitating independent study, and stimulating creativity and critical thinking. Furthermore, the higher education students also reported positive attitudes toward the GenAI tool's role in improving comprehension, providing personalized feedback, and saving time for both learners and instructors.

Previous studies showed another negative aspect of the use of GenAI in education. Previous studies found that students reported concerns about the use of GenAI tools in education. Some of these concerns were academic, including risks to academic integrity related to plagiarism and overreliance, as well as potential reductions in independent problem-solving and critical thinking. In addition, some of these concerns were related to inaccurate outputs generated by GenAI tools, for which there is no clear rationale for their answers. Another set of concerns was ethical ones, related to privacy issues associated with the use of GenAI in education. Furthermore, previous studies have identified legal concerns regarding intellectual property in AI-generated content. The mixed results regarding positive and negative aspects indicate that there is no clear consensus among students about the overall usefulness of GenAI in education. While many students embrace their convenience, personalization, and motivational qualities, others emphasize the importance of safeguards, guidance, and balanced integration into teaching and learning processes.

In developing countries in general, and in Jordan in particular, the adoption of GenAI is still in its infancy. There is no comprehensive plan to guide the use of these tools in the educational process. However, to develop a policy tailored to the educational system, it is necessary to understand stakeholders' perspectives, particularly students' responses. Understanding how students perceive and interact with these tools is essential to shaping effective implementation strategies. Given the complexity of students' experiences and the nuanced opportunities and challenges involved, qualitative exploration is particularly necessary to capture their voices richly. Their insights can highlight practical benefits, potential risks, and the kind of support needed from educators. By capturing these perspectives, the study contributes valuable input toward building AI-informed educational frameworks that are responsive. The current study aimed to qualitatively examine the College of Education female students' perspectives on the opportunities and challenges of using GenAI in education.

3. Methodology

This research study adopted a qualitative, descriptive, and exploratory design to examine female prospective teachers' perspectives on the opportunities and challenges of the educational uses of GenAI tools. The study collected data at a single point in time using an open-ended questionnaire, which is well-suited to capturing participants' experiences, opinions, and feelings in their own words. Using qualitative analysis, this study intended to answer the following research questions:

(1) What are the perceived opportunities of female prospective teachers regarding the educational uses of GenAI tools?

(2) What are the perceived challenges of female prospective teachers regarding the educational uses of GenAI tools?

The use of cross-sectional, open-ended questions and thematic analysis of the responses would allow us to capture rich, context-sensitive descriptions of participants' perspectives, which is appropriate for addressing the two research questions.

3.1. Participants

The current study collected data from 15 participants. All participants were female and registered in the 'The application of educational computer' course during the second semester of the 2024/2025 academic year. The participants were from the college of education. The participants

were aged 18-22. Selecting the study's sample involves two stages. First, purposive sampling of students in the course who had used GenAI tools as part of the course requirements during the semester was selected. Second, from this eligible group, a random sample of 15 students who agreed to participate in the study was selected for the final sample. The sample of 15 participants was sufficient for this qualitative descriptive study because the group was, to some extent, homogeneous.

3.2. Instruments

An open-ended questionnaire was the primary data-gathering tool for this study. The questions were carefully formulated to address the research purpose. To capture comprehensive data on female prospective teachers' perspectives on the opportunities and challenges of the educational uses of GenAI tools, the questions were divided into three dimensions, rather than the six in Patton's (1990) classification. The number of questions in the instrument was nine. The following table presents examples of these questions by the selected dimensions. The appropriateness and face validity of the questionnaire were evaluated by a panel of experts in educational technology.

Table 1. Examples of the open-ended questions in the questionnaire

Dimension 1: Behaviors / Experiences
<ul style="list-style-type: none"> • What type of academic activities did you use GenAI tools for?
Dimension 2: Opinions / Values
<ul style="list-style-type: none"> • What challenges did you face while using GenAI tools?
Dimension 3: Feelings / Emotions
<ul style="list-style-type: none"> • How did using GenAI tools affect your self-confidence as a student?

3.3. Study settings and procedure

The study took place during the second semester of the 2024/2025 academic year. The study took place in a "The application of educational computer" course. The course was offered to students in the College of Education at a university in Jordan. The students were asked to use GenAI as part of their learning in this course. In the last week of the semester, a group of students was randomly selected to participate in this study by completing a questionnaire with open-ended questions. The instructor clarified the study's purpose to participants, emphasizing that participation was for research purposes only and that there were no right or wrong answers. The participation in the study was voluntary. Participation in this study did not influence the participants' course grades. Students provided their consent to participate in the study. Participants in the class completed the questions on paper. It took about one hour for the participants to answer the questions.

3.4. Data analysis

Qualitative data analysis methods were used to analyze students' responses in the open-ended questions. The students' responses to the open-ended questions were analyzed using inductive thematic analysis. Inductive thematic analysis was used because the study was exploratory and little was known about this group. Students' responses to the questions were analyzed following four steps: organizing and familiarizing, coding and reducing, and interpreting and representing (Ary, Jacobs, Sorensen, & Razavieh, 2010). Codes were grouped into broader categories with two main themes. First, perceived opportunities, and second, perceived challenges. For confidentiality and ethical reasons, participants' real names were not used in the presentation of the results. Instead, codes (P1, P2, P3, ...) were assigned to all participants to ensure anonymity while maintaining the clarity and integrity of the findings.

4. Results

Based on students' responses and the aim of the current study, the results were grouped into two themes: (1) perceived support opportunities of the educational uses of GenAI tools, and (2) perceived challenges of the educational uses of GenAI tools. The following two sections present the results.

4.1. Perceived support opportunities of the educational uses of GenAI tools

Regarding the opportunities for using GenAI in prospective teachers' education, their responses were classified into three main categories: first, opportunities related to academic learning as students; second, opportunities for supporting professional readiness as future teachers; and third, opportunities for enhancing self-awareness and confidence.

4.1.1. Opportunities related to academic learning for students

As for the first category, several opportunities were identified. First, students believed that GenAI plays a major role in facilitating their understanding of educational content. They believed that GenAI helps them learn by summarizing academic content, analyzing complex concepts, and breaking down difficult texts, thereby facilitating gradual comprehension of educational material. For instance, P1 stated: "The GenAI tools helped me in simplifying complex concepts and enhancing my skills in analysis and academic writing."

Secondly, students believe that GenAI tools play a significant role in enhancing their academic efficiency by saving time on preparing assignments, translating texts into and out of Arabic, organizing information, and rephrasing academic content in a clearer manner. As P2 pointed out: "*I needed a way to organize my thoughts and research more quickly and effectively... GenAI tools helped me a lot, especially when I was confused about where to start or how to phrase the idea.*" In addition, P1 stated that "*The main reason I used GenAI tools was my desire to simplify academic tasks and save time... I relied on them for summaries and study ideas.*"

Thirdly, some students mentioned that GenAI helped them think more clearly. They believe that GenAI tools might play an important role in enhancing their creative thinking. They reported that the tools helped organize ideas and supported academic writing. As P3 pointed out, "*My use of GenAI tools went beyond typical academic tasks to include creative activities such as writing short stories and analyzing articles. GenAI helped me develop my critical thinking.*"

Fourthly, students highlighted the importance of GenAI tools in improving the quality of their academic output. They believe these tools play a major role in enhancing academic language. GenAI contributes to the production of high-quality academic reports and educational projects. As P4 pointed out, "*The GenAI tools helped me improve the quality of my writing, and that gave me great confidence. I began writing in a more organized manner and using more precise academic language. One of my professors even commented on the noticeable improvement in my style.*"

Fifthly, students believe that GenAI tools would play a significant role in fostering their academic independence. By reviewing the outputs of GenAI tools, students have improved their ability to evaluate the content they produce, thereby contributing to the development of their analytical thinking skills. As P4 pointed out, "*I started learning with greater awareness and began reviewing and proofreading what I write... I learned how to benefit from technology without relying on it much.*"

Sixth, students also pointed to the role that GenAI tools play in enhancing their active and self-directed learning by serving as an intellectual partner. They believe that GenAI tools can be used to generate questions and then answer them, allowing students to compare their own answers with those provided by the GenAI. Additionally, students can compare their interpretations with those of the AI-generated content, leading to a deeper and more nuanced understanding of the concepts. For

instance, P5 stated that *"I ask ChatGPT, then I request examples or clarifications, and sometimes I go back and ask it to explain a term or provide an opinion. Our interaction has become deeper."* In addition, P6 stated, *"The interaction was dialogic... I ask specific questions, analyze the answers, then request clarifications or additional details... it developed into a deep conversation."* P7 stated that *"I started asking follow-up questions for ChatGPT, ... The dialogue became more dynamic, as if I were discussing with a smart friend."*

4.1.2. Opportunities for supporting professional readiness as prospective teachers

As prospective teachers, the participants believed that GenAI tools would provide important opportunities to support their professional readiness. First, the students pointed out the potential role of GenAI tools in facilitating educational planning, including accelerating the preparation of lesson plans, formulating educational objectives, and designing and producing instructional materials, including classroom presentations. For instance, P8 stated that *"GenAI tools can be used for preparing lessons, activities, assessments, and instructional resources."*

Second, the students emphasized the role of GenAI tools in developing personal and professional skills as future teachers. They referred to the use of these tools for interview training, résumé preparation, and the enhancement of communication and academic presentation skills. They believed that GenAI tools would provide a practical simulation of real-world situations. P1 stated that *"I can use GenAI tools to improve my resume and practice answering interview questions. These tools would help me formulate more organized responses."*

Third, the students pointed to the expected role of GenAI tools in supporting community and entrepreneurial initiatives, noting that these tools can generate innovative ideas to advance community projects aligned with learners' needs. P6 stated that *"Gen AI tools can be used beyond their regular use of finding information; they can be used to generate creative ideas for extracurricular projects, such as proposals for community awareness campaigns."*

Fourth, the participants highlighted the role of GenAI tools in enhancing their future teacher roles as instructional designers, enabling them to generate content, support classroom interaction, and personalize the learning process.

It enables them to tailor instruction to different learners. P8 stated that *"GenAI tools can help me as a future teacher to accomplish tasks that need an instructional designer's knowledge and skills"*.

4.1.3. Opportunities related to enhancing self-awareness and confidence

Opportunities related to enhancing self-awareness and confidence emerged as a key theme in students' experiences with GenAI tools. Many students expressed that using these tools made them feel more capable, independent, and confident in their academic abilities. Firstly, the students highlighted the role of GenAI in building self-confidence, noting that the intelligent, personalized output generated by GenAI tools enhances their sense of competence. For example, P8 stated that *"GenAI increased my confidence because I learned how to use the tool and add my own touch. I became more creative, and my way of writing content became more professional."* P9 also added, *"GenAI boosted my confidence as a student because it helped me become more organized and get quick support whenever I needed it."*

Second, the students pointed out the role of GenAI tools in enhancing their ethical responsibility in learning. The free availability of these tools has contributed to students' awareness of using GenAI as a supportive assistant. For instance, P10 stated that *"I started setting rules for myself, such as not using the tool until I had written an initial draft first."* In addition, Ilham added, *"I deal with these concerns by trying to use the tool as a helper, not a complete substitute for myself. It supports me, but it doesn't do everything for me."*

4.2. Perceived challenges of the educational uses of GenAI tools

Regarding the educational uses of GenAI tools, responses were classified into four categories: technical, psychological, ethical, and social and institutional challenges.

4.2.1. Technical challenges

The results showed that some students had trouble interacting with technology in general and with GenAI tools in particular, due to a lack of technical expertise. For example, P11 noted that a major challenge she faced was "technical difficulties in using the computer or even the smartphone itself," which limited her ability to use the tool effectively.

Secondly, some students reported inaccuracies in certain outputs produced by GenAI tools and mismatches between those outputs and the specific contexts of the questions asked. For instance, P12 stated: *"Not everything provided by AI tools is accurate; sometimes there are incorrect dates or terms."* While P13 explained, *"I always verify the accuracy of the information produced by AI tools and compare it with other sources."*

Thirdly, students highlighted the challenge of formulating prompts for GenAI tools to elicit precise responses. Several students noted that the quality of the answers depends on how the question is phrased. For example, P8 said: *"Sometimes it's difficult to phrase the question clearly so that AI understands it."* Student P9 added: *"Some of the responses were too general or didn't match the context, so I had to rephrase the questions."* Additionally, p1 observed: *"The deep interaction developed when I started asking more precise questions."*

Fourthly, the students reported technical difficulties accessing GenAI services, particularly related to internet connectivity. For example, P14 noted: *"There are technical challenges; sometimes we can't connect to the internet, or the connection is too slow to even open these tools."*

4.2.2. Psychological challenges

The students faced a range of psychological challenges that impacted their experience with GenAI tools. First, some students explained that a major challenge of using GenAI in the academic process is the fear of overreliance on the tool if it is used for all academic activities. They believed that might lead to a psychological attachment. P4 expressed this concern by saying, *"When I use GenAI tools, I begin to doubt my ability to write without them."*

Second, students reported anxiety about using AI tools, fearing negative judgment from their colleagues and teachers. They believe that when others discuss using these tools, they may accuse them of being undiligent. For example, P1 said, *"I do not discuss my use of GenAI with other students or my professors at the university, even though I am convinced of its effectiveness"*.

Third, students' use of GenAI tools was associated with concerns about the loss of personal academic skills. For example, students expressed concern that using GenAI tools could negatively affect their writing skills and analytical thinking. As P9 stated, *"I try to be careful to avoid complete reliance on GenAI tools so as not to lose my personal skills in writing."* Meanwhile, P3 stated, *"I set clear boundaries for the use of GenAI tools and employ them as a means of development, not as a substitute for my own effort."*

Fourth, some students reported frequent feelings of guilt when completing academic tasks using GenAI tools, compared with traditional methods that require greater personal effort. For example, reflecting on this conflict between technology-enabled convenience and personal effort, p. 10 stated, *"I always wondered, 'Should I use this tool? Is using it considered cheating? Am I relying on it? Am I relying on it too much?"*

Fifth, some students indicated anxiety associated with the use of GenAI and unrealistic achievement inflation. They expressed concern that the quality of work produced using GenAI tools might inaccurately reflect their actual performance. For example, P3 said, *"I felt a sense of hesitation and over-reliance on these tools, which made me feel that the academic work did not represent me."*

Sixth, some psychological challenges were associated with feelings of self-doubt when students compared their own abilities with those of the GenAI tools. P5 explained, *"At first, I often thought, 'Why didn't I come up with what the GenAI tool suggested?'"*

4.2.3. Ethical challenges

The students faced a set of ethical challenges related to the use of GenAI tools. First, the students faced the problem of distinguishing between using GenAI tools as an aid in the educational process and as a means of academic cheating. For example, P10 stated, from an ethical perspective, *"I sometimes wondered if my use of generative AI tools was considered cheating."* P7 expressed her ethical hesitation about using AI tools: *"Is it fair for me to use this tool while my classmates do not use it to solve assignments?"*

Second, the ethical challenges of employing GenAI tools in the educational process were linked to documentation issues. Some students indicated that the tool does not provide sources for the generated content, which raises doubts about the credibility of the generated texts for academic purposes. Accordingly, P6 said, *"When I use GenAI tools, I always need to rewrite and document the references myself."*

Third, the ethical challenges stemmed from concerns about compromising academic values when using GenAI tools in the educational process. The frequent use of AI tools has raised concerns among some students about whether their results reflect genuine effort or merely machine-generated output. For example, P4 stated, *"I always wonder if it is appropriate to use this tool to write part of my academic assignment."*

4.2.4. Social and institutional challenges

Some participants reported social and institutional challenges associated with the use of GenAI tools in academia. The first set of these challenges was associated with reservations among some professors regarding these tools, with positions ranging from support to complete rejection of their use. For instance, P9 stated that, *"We discussed the matter with our professors... some were supportive, while others feared that the tool would weaken the student's abilities."*

Secondly, the challenge concerned the differing opinions among colleagues regarding the use of GenAI tools in the educational process. Some were highly enthusiastic about using these tools and openly shared their experiences. On the other hand, others expressed concern that AI would erode proficiency and be considered cheating, creating a sense of division. For example, P8 said: *"Some were enthusiastic and started using the tools, while others were hesitant."* She mentioned discussions that took place around *"the importance of using it in education."* P6 also stated that *"We discussed the topic with my colleagues... some were supportive, while others were afraid of over-reliance."*

Third, the students also expressed the challenge posed by the lack of official institutional guidance at the university on the legitimacy of using GenAI tools. For example, P1 said, *"There was a discrepancy between those who encouraged it and those who discouraged it. There is no unified policy at the university."*

Fourth, the students expressed the challenge posed by the negative social stigma associated with those who use GenAI tools in the educational process. This perception led some to feel guilty when speaking publicly about their use of GenAI tools. People question their credibility, despite its usefulness. P15 reported facing ambivalent feelings about using the tool due to social stigma.

Fifth, the challenge stemmed from limited student awareness of the use of GenAI tools in education and from the absence of formal university training in their application. This can lead to indiscriminate use, sometimes overreliance, or excessive hesitation. For instance, several students reported a lack of awareness, skills, and formal training in using these tools.

5. Discussion

The findings showed that prospective teachers believe that GenAI tools are useful for supporting their learning, their future teaching profession, and their academic confidence. In terms of supporting learning, the participants believed that GenAI tools can help them understand educational content, enhance academic efficiency, improve creative thinking, increase academic output, and facilitate independent, self-directed learning. In their future teaching roles, the participants believed that GenAI tools would support educational planning, the development of instructional materials, the development of professional skills, the support of entrepreneurial initiatives at the community level, and the development of instructional design competence. In addition, the participants believed that GenAI has a role in boosting their confidence and competence while encouraging ethical responsibility. Students regarded GenAI as an intellectual partner that enhanced both their learning and future teaching roles. The findings suggest participants viewed GenAI as an intellectual partner that advances their academic progress, prepares them for future teaching, and supports their personal development. GenAI is transforming how prospective teachers engage with technology, becoming an integral part of both their current and future personal and academic lives. Table 2 shows a summary of the perceived opportunities of GenAI use in teacher education.

An interesting aspect of the findings is the participants' belief that GenAI tools increased their creativity, since much of the existing literature highlights concerns that GenAI may threaten students' creative capacity by fostering dependency (Zhai, Wibowo, & Li, 2024). This contrast suggests that creativity in relation to GenAI is a double-edged phenomenon: on the one hand, the tools can inspire idea generation, provide new perspectives, and support imaginative academic tasks; on the other hand, they may risk narrowing authentic expression if over-relied upon.

The findings regarding support opportunities of the educational uses of GenAI tools in terms of enhancing understanding of educational content and improving academic efficiency aligned with findings of previous studies (Silva et al. 2024), the findings where students highlighted ChatGPT's ability fosters self-directed learning, improves academic output, and boosts confidence aligned with findings other previous studies (Pavlenko & Syzenko's 2024). Furthermore, the findings regarding. The role of GenAI in supporting independent and self-paced learning resonates with the findings of Ngo (2023) and Leleparry et al. (2023), who highlighted benefits such as time saving, personalized feedback, and idea generation, while emphasizing GenAI as an intellectual partner that strengthens both academic and professional growth. Moreover, reporting similar findings, studies conducted in Spain (Campillo-Ferrer et al., 2025), Hong Kong (Chan & Hu, 2023), Saudi Arabia (Almassaad et al., 2024), and Lebanon (Fawaz et al., 2025) highlighted GenAI's contribution to motivation, task support, writing improvement, and the provision of personalized learning environments. However, the findings of the current study extend the discourse beyond student experiences to the perspectives of teachers preparing for their professional roles. Prior studies have examined independent learning, but the current study focuses on the benefits of GenAI in facilitating self-directed learning and preparing for teaching roles.

Table 2. Perceived Opportunities of GenAI Use in Teacher Education

Category	Findings
Opportunities for Learning	<ul style="list-style-type: none"> - Understanding educational content more effectively - Enhancing academic efficiency and output - Improving creative thinking and idea generation - Supporting independent and self-directed learning
Opportunities for Professional Development	<ul style="list-style-type: none"> - Supporting lesson planning and instructional design competence - Assisting in the development of instructional materials - Enhancing professional skills and teacher preparedness - Supporting entrepreneurial and community-level initiatives
Opportunities for Confidence and Growth	<ul style="list-style-type: none"> - Boosting academic confidence and competence - Encouraging ethical responsibility - Positioning GenAI as an intellectual partner in learning and teaching

In terms of perceived challenges, the findings showed that the prospective teachers believed that the educational use of GenAI tools was associated with various types of challenges, including technical challenges, psychological challenges, ethical challenges, and social and institutional challenges. In terms of technical challenges, the participants believed that the educational use of GenAI tools might be challenged with their limited technical expertise, inaccurate GenAI outputs, difficulty in formulating prompts, and internet connectivity issues. The reported psychological challenges were related to overreliance, anxiety of negative judgment, loss of academic skills, academic integrity guilt, anxiety of achievement inflation, and self-doubt. The reported ethical challenges were related to the cheating fairness dilemma, documentation credibility issues, and compromised academic value. At the same time, the reported social and institutional challenges were related to differences in faculty acceptance of using GenAI, peer opinion conflict, unclear institutional policy, potential GenAI usage stigma, and insufficient AI literacy. Table 3 shows a summary of the perceived opportunities of GenAI use in teacher education. The reported challenges showed that students' concerns go beyond simple usability issues. The reported challenges extended into deeper psychological, ethical, and social dimensions. The unique nature of GenAI technology as a two-way chatting system that mimics human intelligence makes the challenges students face look like those in real human relationships. For instance, people may struggle with trust, confidence, or communication in personal interactions, and experience similar difficulties when engaging with GenAI. This analogy highlights why adopting GenAI is not only a technical matter but also a deep social and psychological experience. Another potential explanation for the findings is that participants learned about GenAI independently due to a lack of information in their official curriculum on the educational use of GenAI.

Some findings regarding prospective teachers' perceptions of the challenges of using GenAI tools in education align with those of similar studies. For instance, issues related to overreliance on and the threat posed by GenAI to academic integrity have been previously reported (Silva et al., 2024; Fawaz et al., 2025; Almassaad et al., 2024). In addition, concerns regarding accuracy, access, and the lack of a clear policy have previously been reported (Fawaz et al., 2025; Gasaymeh et al., 2024; Almassaad et al., 2024). Furthermore, privacy and data security issues were also reported in similar research studies (Chan & Hu, 2023; Fawaz et al., 2025; Gasaymeh et al., 2024), as well as pedagogical

concerns such as reduced human interaction, diminished critical thinking, and weaker learning autonomy (Silva et al., 2024; Leleparry et al., 2023; Almassaad et al., 2024). In addition, the study conducted in Spain (Campillo-Ferrer et al., 2025) similarly highlighted reliance on technology, ethical issues, and privacy concerns as key challenges. However, the findings revealed novel challenges not reported in previous studies, including feelings of guilt and ethical hesitation, fear of negative judgment, self-doubt, achievement-inflation anxiety, social shame, and peer division when using GenAI in education.

Table 3. Perceived Challenges of GenAI Use in Teacher Education

Category	Findings
Technical Challenges	<ul style="list-style-type: none"> - Limited digital/technical expertise - Inaccurate or context-mismatched outputs - Difficulty in formulating effective prompts - Internet connectivity issues
Psychological Challenges	<ul style="list-style-type: none"> - Overreliance on GenAI - Anxiety of negative judgment from peers/professors - Loss of academic skills (e.g., writing, critical thinking) - Feelings of guilt and ethical hesitation - Achievement inflation anxiety - Self-doubt when comparing abilities with AI
Ethical Challenges	<ul style="list-style-type: none"> - Cheating and fairness dilemmas - Documentation and referencing credibility issues - Fear of compromised academic value
Social & Institutional Challenges	<ul style="list-style-type: none"> - Differences in faculty acceptance (support vs. rejection) - Peer opinion conflicts and social division - Unclear institutional policies and lack of guidance - Stigma attached to GenAI use - Insufficient AI literacy and lack of formal training

The findings suggest that prospective teachers perceive GenAI as a double-edged phenomenon, where it enhances learning, creativity, and professional preparation, yet it also raises significant technical, psychological, ethical, and institutional challenges. While many of these challenges echo earlier studies, this research revealed new dimensions such as guilt, fear of judgment, self-doubt, and social stigma. These insights underscore that GenAI adoption is not only a technical matter but also a psychological and social experience requiring balanced guidance and clear institutional policies.

6. Conclusion

GenAI tools have great educational opportunities for students in teacher education programs. According to prospective teachers, GenAI tools are useful for supporting their learning, their future teaching profession, and their academic confidence. However, the educational use of GenAI tools was associated with various challenges, including technical, psychological, ethical, and social and institutional. This suggests that the adoption of GenAI tools for educational use needs critical planning and support to ensure balanced and effective integration into educational practice.

6.1. Recommendations for Practice

Based on the findings of this study, several recommendations can be offered for policy and practice regarding the use of GenAI tools in higher education more generally and in teacher education in particular. These recommendations can be categorized based on the level of implementation. At

the course level, taking into account the various opportunities for the educational use of GenAI, findings suggest formally integrating GenAI into teacher education through modules on pedagogical applications of GenAI and simulations in which students experiment with GenAI. However, the findings underscored the need to balance the use of GenAI tools with traditional skill development to preserve writing and critical thinking. Another important recommendation derived from the findings is the need to formally promote the ethical and responsible use of GenAI. In addition, faculty members should communicate to the students the ways that GenAI tools are allowed to be used, stressing to students to deal with GenAI as a professional tool, not as a shortcut, and as a collaborative partner, not as a replacement.

At the university level, the findings highlighted the need to develop students' GenAI literacy, with a focus on the responsible use of these tools and associated misconceptions. In addition, the institution of higher education should establish and unify clear guidelines on acceptable versus unacceptable uses of GenAI for academic purposes. In addition, the institution of higher education should encourage faculty members to use GenAI and provide training to model ethical use of GenAI. Furthermore, during the adoption of new technology, technical infrastructure should be available, and technical support should be provided to faculty and students. Finally, institutions of higher education should leverage GenAI for community and entrepreneurial initiatives.

6.2. Recommendations for Future Studies

The current study is expected to serve as a knowledge base for future research on the acceptance and integration of GenAI in higher education more broadly and teacher education in particular. However, based on the findings of the current study, several issues warrant further investigation regarding the use of GenAI in teacher education programs. Future studies employing various research designs are needed to examine the efficacy of GenAI across dimensions of students' learning, such as performance, motivation, creativity, and self-efficacy. The current study revealed some psychological and personal issues associated with the educational use of GenAI that need further investigation, such as guilt, fear of judgment, self-doubt, achievement inflation anxiety, and dependency risks. Furthermore, it is necessary to investigate the perceptions of other stakeholders regarding the educational use of GenAI, including faculty members and higher education administrators.

6.3. limitations of the study

Like any other study, the current study has some limitations. Some of these limitations were related to the number and characteristics of the participants: only 15 female students who were drawing from a course in a college of education at a university in Jordan participated in the current study, which may limit the generalizability of the Findings. The second set of limitations is related to the data collection tool and the design of the study. The study employed a cross-sectional qualitative design that captured participants' perspectives on GenAI at a single point in time. The data collection tool was a questionnaire with open-ended items, which may limit the depth of information obtained compared with interviews. Additionally, another limitation concerns the nature of the GenAI tools used, particularly as institutional policies governing their adoption and regulation are rapidly evolving to address these developments.

Declarations

Author Contributions. A.-M.G. is the sole author and was responsible for conceptualization, methodology, investigation, formal analysis, writing—original draft, and writing—review and editing. The author has read and agreed to the published version of the manuscript.

Conflicts of Interest. The author declares no conflict of interest.

Ethical Approval. Informed consent was obtained from all participants prior to their inclusion in the study, and all data were collected and handled in strict accordance with confidentiality and ethical standards.

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