

Exploring Perspectives of Teacher Students Toward Generative AI Technologies

Krittanaï Thararattanasuwan¹ & Veena Prachagool²

¹ Faculty of Industrial Education, Rajamangala University of Technology Suvarnabhumi, Ayutthaya, Thailand

² Faculty of Education Mahasarakham University, Mahasarakham, Thailand

Correspondence: Veena Prachagool, Faculty of Education Mahasarakham University, Mahasarakham, Thailand.

Received: February 29, 2024

Accepted: May 10, 2024

Online Published: August 30, 2024

doi:10.5539/ies.v17n5p22

URL: <https://doi.org/10.5539/ies.v17n5p22>

Abstract

The relevance of incorporating AI into educational settings is growing as the technology develops. This research delves into the perspective of pre-service teachers on generative AI technology. This study employed 45 pre-service teachers to raise their perspective towards AI technology and then explore its correlation about components of AI technology by their perspectives. The findings revealed that they had perspective towards artificial intelligence technology at slightly accepted level, perspective towards willingness to use AI technology at moderately accepted and very much accepted levels, and perspective towards concerns about artificial intelligence technology at moderately accepted and slightly accepted levels. These results have important things that it can be implied to pedagogy, curriculum development, and teacher training programs.

Keywords: AI literacy, AI technology, perspective, teacher preparation, teacher student

1. Introduction

The emergence of generative AI technology has triggered a learning paradigm shift in modern education. This may change capacity to learn and work with a deeper look at its potential and the information. Generative AI is a complex algorithm that has been trained on enormous datasets. It uses the concept of deep learning methods that like generative adversarial networks and transformers discover the underlying patterns and correlations in the data (Alasadi & Baiz, 2023). In addition, it is widely applied in different fields for working and learning.

Education employed generative AI technologies in personalized learning, AI-powered storytelling is changing how we learn and consume information. However, enormous power comes with great responsibility. So that, we have to understand the information included in generative AI models. It is a critical to their safe development and deployment in use. Training data might have biases, which can be unintentionally mirrored in the resulting results. Understanding and minimizing these biases is crucial to ensuring the ethical and equitable use of technology (Budiarto et al., 2024). The complexity of these models, it might be difficult to grasp how they produce their results. Explainability is critical for establishing confidence and promoting responsible usage. Generative AI technologies are fast advancing, pushing the limits of creativity and altering many sectors. We can assure their responsible growth and maximize their potential for benefit in education. It is our obligation to guarantee that its knowledge leads to a better future, one based on understanding, ethics, and a common vision for human-AI partnership.

For example, AI-powered text production may automate content development, freeing up crucial time for generating, writing, answering, and giving feedback. Experiences tailored to individual tastes are becoming more valuable based on personalized learning. Generative AI can tailor learning lessons, curriculum design, and ideas for instructional practices (Baidoo-Anu & Ansah, 2023; Nuangchalerm & Prachagool, 2023; Nuangchalerm & Saregar, 2024). Despite the potential advantages, a number of obstacles prevent broad adoption, but issues such as bias in AI models, AI-generated material all present ethical issues that must be addressed before public trust can be established. To bridge the gap between technology, promise and social willingness, many fundamental measures are critical.

Educating the public about generative AI's potential and limits may help to debunk misunderstandings and promote understanding. AI as a tool for supplementing rather than replacing human talents, we may foster effective human-AI cooperation. AI technology depends on a careful balance (Kaplan-Rakowski et al., 2023). By

admitting the challenges, promoting ethical development, and stressing the potential advantages, we can pave the way for a future in which humans and AI work together to build a better tomorrow. It is critical to remember that generative AI is not a substitute for human creativity but rather a powerful tool that may be used to enhance it. While issues exist, understanding the motivations and constraints is critical for creating a future in which humans and AI collaborate to accomplish common objectives.

Generative AI technology is driving rapid change in the educational environment. These algorithms, capable of producing fresh material ranging from text and graphics to interactive simulations. Its potential can transform teaching and learning experiences in such positive or negative ways. However, in order to achieve this promise, teacher preparation programs must adapt and provide educators with the knowledge and skills required to safely and successfully harness the power of generative AI (Dron, 2023; Liu et al., 2023). It provides teachers with a wealth of possibilities in curriculum design and development. AI-powered systems can personalize instructional material to each student's requirements, learning style, and speed, resulting in greater engagement and comprehension.

Artificial intelligence may automate monotonous processes like grading essays or tests, freeing up crucial time for tailored feedback and contact with students. Generative AI technologies may help student with creative writing, storytelling, and artistic expression, helping them to discover their full potential and build critical thinking abilities. However, we are concerning about prejudice, data privacy, and the possibility of AI-generated disinformation need careful implementation and adherence to ethical standards (Michel-Villarreal et al., 2023). Educators must be trained students to understand how generative AI works, its limits, and how to integrate it responsibly into their teaching methods. Teacher preparation programs must include aspects that address these difficulties and provide educators with the essential skills.

The use of generative AI in education represents a substantial change in our curriculum and pedagogy. Both pre-service and in-service teachers require the necessary knowledge and skills through AI technologies. We can ensure that this technology is a powerful tool for personalized learning, fostering a future in which every student thrives in a dynamic and engaging learning environment (Prachagool et al., 2022). AI-powered classroom is about enabling teachers to use technology to the advantage of all students. This study aims to explore perspectives of teacher students toward generative AI technologies, it can provide some information to tailor curriculum and instruction for teacher preparation program.

2. Method

The perspectives of teacher students with regard to generative artificial intelligence technology are investigated in this research. The specifics may be explained in the following manner.

2.1 Informant

There are a total of 45 undergraduate students that are taking part in this study on a volunteer basis. The students are now enrolled in Mahasarakham University, where they are pursuing their studies in the field of teacher education. They are currently in the second semester of the 2023 academic year. They learn the essential abilities to search, summarize, and write, in addition to the ability to engage with a variety of artificial intelligence tools.

2.2 Research Tool

The research instrument is a questionnaire for teacher students that examine their thoughts on generative artificial intelligence technology. The questionnaire consists of 18 questions and a 9-point rating scale. The questionnaire is a modified version of the one that Chan and Hu (2023) published, and it has two sections: The first section of this study focuses on the viewpoints of teacher students about generative artificial intelligence technologies. These perspectives include an understanding of generative AI technologies, a desire to employ generative AI technologies, and worries regarding generative AI technologies. A nine-level estimate scale, ranging from the greatest to the lowest levels, is used to define the degree of views that teacher students have on generative artificial intelligence technology. In the second part of the survey, an open-ended questionnaire was used to collect free opinions on the knowledge of generative artificial intelligence technologies, the readiness to employ these technologies, and the worries regarding these technologies.

2.3 Data Collection and Analysis

The researchers collected data by employing perspectives of teacher students toward generative AI technologies after they had practicing some AI technologies. The researchers examined the accuracy and integrity of the data which can be analyzed the data using basic statistics, including mean and standard deviations, and then compared the average scores obtained against the learning anxiety level. The level of learning anxiety can be calculated and interpreted mean ranges 8.51-9.00 extremely accepted level, 7.51-8.50 very much accepted level,

6.51-7.50 moderately accepted level, 5.51-6.50 slightly accepted level, 4.51-5.50 neither accepted or rejected level, 3.51-4.50 slightly rejected level, 2.51-3.50 moderately rejected level, 1.51-2.50 very much rejected level, and 1.00-1.50 extremely rejected level respectively.

3. Results and Discussion

Pre-service teachers had perspective towards generative AI technologies ranged neither accepted or rejected, slightly accepted, moderately accepted, and very much accepted levels (Table 1).

Table 1. Perspective towards generative AI technologies

Item	Mean	SD	Level
Knowledge of artificial intelligence technology			
1. I understand that artificial intelligence technologies such as ChatGPT have limitations in managing complex tasks	5.98	1.99	slightly accepted
2. I understand that artificial intelligence technologies such as ChatGPT can generate factually incorrect results	6.24	1.92	slightly accepted
3. I understand that artificial intelligence technologies such as ChatGPT can generate results that are not contextual	6.42	2.01	slightly accepted
4. I understand that artificial intelligence technologies such as ChatGPT can show results with bias and unfairness	4.62	2.72	neither accepted or rejected
5. I understand that artificial intelligence technologies such as ChatGPT may rely too much on statistics and data, which may not be suitable for certain contexts	6.49	1.96	slightly accepted
6. I understand that artificial intelligence technologies such as ChatGPT can show insensitive results	6.31	2.08	slightly accepted
Willingness to use AI technology			
7. I imagine integrating artificial intelligence technologies such as ChatGPT into my teaching and learning approach in the future	7.49	1.52	moderately accepted
8. Students must learn how to use artificial intelligence technology well for their careers	8.09	1.12	very much accepted
9. I believe that artificial intelligence technologies such as ChatGPT can improve my digital capabilities	7.71	1.46	very much accepted
10. I believe that artificial intelligence technologies such as ChatGPT can save me time	8.38	0.83	very much accepted
11. I believe that artificial intelligence technologies like ChatGPT can provide unique insights and perspectives that I may not have thought of before	7.01	1.60	moderately accepted
12. I think artificial intelligence technologies like ChatGPT can provide personalized and responsive feedback and advice instantly	7.22	1.61	moderately accepted
13. I think artificial intelligence technologies like ChatGPT are great tools to use	7.40	1.54	moderately accepted
14. I think artificial intelligence technologies like ChatGPT are a great tool for student support services due to their anonymity	7.20	1.62	moderately accepted
Concerns about artificial intelligence technology			
15. Using artificial intelligence technologies such as ChatGPT to complete assignments may diminish the value of university education	6.69	2.21	moderately accepted
16. Artificial intelligence technologies like ChatGPT will limit my opportunities to interact with others and socialize while taking courses	6.04	2.24	slightly accepted
17. Artificial intelligence technologies such as ChatGPT will hinder the development of common or transferable skills, such as teamwork. Problem solving and leadership skills	6.27	2.21	slightly accepted
18. I can learn and rely heavily on artificial intelligence technology	7.42	1.63	moderately accepted

Pre-service teachers had perspective towards knowledge of artificial intelligence technology at slightly accepted level. The most highest mean score consisted of “*I understand that artificial intelligence technologies such as ChatGPT may rely too much on statistics and data, which may not be suitable for certain contexts*”, “*I understand that artificial intelligence technologies such as ChatGPT can generate results that are not contextual*”, and “*I understand that artificial intelligence technologies such as ChatGPT can show insensitive results*”, but only item “*I understand that artificial intelligence technologies such as ChatGPT can show results with bias and unfairness*” was at neither accepted or rejected level.

Pre-service teachers had perspective towards willingness to use AI technology at moderately accepted and very much accepted levels. The highest mean score consisted of “*I believe that artificial intelligence technologies such as ChatGPT can save me time*”, “*Students must learn how to use artificial intelligence technology well for their careers*”, and “*I believe that artificial intelligence technologies such as ChatGPT can improve my digital capabilities*”. They had perspective towards concerns about artificial intelligence technology at moderately accepted and slightly accepted levels. The highest mean score consisted of “*I can learn and rely heavily on artificial intelligence technology*”, “*Using artificial intelligence technologies such as ChatGPT to complete assignments may diminish the value of university education*”, and “*Artificial intelligence technologies such as ChatGPT will hinder the development of common or transferable skills, such as teamwork. Problem solving and leadership skills*” as it in the following.

These findings provide a description of the pre-service teachers’ perspectives about a variety of technology-related topics linked to artificial intelligence. Knowledge about artificial intelligence technology indicated that they had a view on artificial intelligence technology that is, to a certain extent, acceptable (Zhang et al., 2023). The possible problems that might arise with artificial intelligence technologies like ChatGPT are the source of the highest mean ratings. The notion that artificial intelligence systems such as ChatGPT may provide findings that are biased and unjust was there (Hassani & Silva, 2023; Rozado, 2023).

Pre-service teachers demonstrated a readiness to embrace artificial intelligence technology that is both somewhat acceptable and very highly accepted. There is a correlation between the perceived advantages of artificial intelligence technology and the highest mean scores for willingness. The conviction that artificial intelligence technology such as ChatGPT may help save time (Javaid et al., 2023). A recognition that students should learn how to apply artificial intelligence for their future employment. They had faith to artificial intelligence technology may enhance digital skills (Yetisensoy & Rapoport, 2023). They can move and integrate digital literacy into AI literacy, deal with artificial technology based on deep understanding about digital literacy (Tinmaz et al., 2020; Prachagool et al., 2022).

However, concerns about artificial intelligence technologies range from moderately acceptable to somewhat accepted. The capacity to learn and the heavy reliance on artificial intelligence technologies are among the worries that received the highest mean ratings. Concerns have been raised over the potential for artificial intelligence technologies, such as ChatGPT, to take away from the value of a university degree. Possession of the belief that artificial intelligence technology may impede the development of qualities that are universal or transferable, such as leadership, problem-solving, and collaboration.

It seems that the pre-service instructors have a variety of viewpoints about artificial intelligence technologies. There are major worries around problems like as prejudice, insensitivity, and the influence on conventional educational principles and skill development, despite the fact that they are eager to embrace and appreciate the potential advantages. From these points of view, it seems that there is a need for comprehensive education and training on artificial intelligence technology (Farrelly & Baker, 2023). This would include addressing both the good and bad sides of the technology and fostering a balanced knowledge among teacher students.

On the other hand, they had a broad variety of perspectives, which seemed to be widely dispersed in some objects. In order to verify the connection between the two, the correlation analysis is used (Table 2). It showed that 3 components of perspective towards AI technologies had correlation at .01 level of significant statistics.

Table 2. Correlation between perspectives toward AI technology components

		Knowledge	Willingness	Concerns
Knowledge	Pearson Correlation	1	.267**	.384**
	Sig. (2-tailed)		<.001	<.001
	N	270	270	140
Willingness	Pearson Correlation	.267**	1	.398**
	Sig. (2-tailed)	<.001		<.001
	N	270	360	140
Concerns	Pearson Correlation	.384**	.398**	1
	Sig. (2-tailed)	<.001	<.001	
	N	140	140	140

** . Correlation is significant at the 0.01 level (2-tailed).

The fact that pre-service teachers hold a variety of perspective suggests that not all of them share their beliefs and attitudes regarding artificial intelligence technology. Individual experiences, educational backgrounds, and exposure to artificial intelligence-related material could all have an impact on this variation. It is essential to have a sound understanding of this variation since it may have an effect on the way in which educators approach the incorporation of AI technology into their instructional methods. The choice to use correlation analysis is a statistical method that assists in determining the connections that exist between the variables being taken into consideration (Schwesig et al., 2023). It is very probable that the researchers are interested in determining whether or not there is a significant link between the various aspects of the pre-service teachers' viewpoints on artificial intelligence technology. By using correlation analysis, they are able to measure the strength of these correlations as well as the direction in which they are moving.

In order to properly evaluate the data, it is essential to have a solid understanding of which three aspects of the viewpoints on artificial intelligence technologies demonstrate a substantial association. The correlation may be positive, which would imply that as one viewpoint grows, the other also tends to grow, or it may be negative, which would suggest that there is an inverse link between the two perspectives (Hermann, 2022). In addition, the strength of the correlation offers information about the degree of linkage that exists between the variables (Felzmann et al., 2020). In addition to having consequences for educational methods, these results also have ramifications for future studies. It may be necessary for educators to modify their approach to teaching artificial intelligence technology in order to accommodate the various points of view held by pre-service teachers. Programs for professional development might be developed to address particular challenges or to emphasize the advantages that are most likely to connect with this particular group.

The concept, components, and potential applications of AI literacy have been extensively studied. A wide variety of college students may acquire a conceptual understanding of AI via a literacy course, according to Kong (2021), even if they have no background in programming. Ng proposed a definition of AI literacy that accounts for understanding, application, evaluation, and moral issues (2021). Yi (2021) emphasized the importance of metacognition and anticipatory abilities in AI literacy, whereas Wagner (2021) introduced the concept of economic AI literacy and stressed its strategic usefulness in business decision-making. All things considered, our results stress the necessity of a multifaceted strategy for AI literacy that accounts for both technical and ethical considerations.

Furthermore, the connections that have been established may serve as a guide for future investigation into the elements that influence these views, which can help in the creation of treatments that are more specifically focused. Correlation analysis is a tool that academics and educators alike may use to traverse the complex terrain of attitudes towards artificial intelligence technology. This helps to develop a more informed and successful incorporation of these technologies into educational settings. Wang et al. (2023) addressed the significance of artificial intelligence literacy in the context of teacher education, with a special emphasis on college students who are aspiring to become teachers. Additionally, the study proposes research ideas and approaches to increase the AI literacy of these students.

4. Conclusion

As technology advances, the integration of digital literacy and AI literacy into educational environments becomes increasingly significant. The present study investigates the viewpoints of pre-service educators regarding generative AI technology. The results of the study indicated that the participants held slightly accepted perspectives regarding their knowledge of artificial intelligence technology, very much accepted perspectives regarding their willingness to use AI technology, and moderately accepted and slightly accepted perspectives regarding their concerns regarding AI technology. The implications of these findings for pedagogy, curriculum development, and teacher preparation programs are substantial, and they contribute to our understanding of how future educators perceive the application of generative AI in the classroom.

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Funding

This research project is financially supported by Mahasarakham University.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Canadian Center of Science and Education.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

Not commissioned; externally double-blind peer reviewed.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

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