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The Study of AI Anxiety on Teacher Trainees' Technological Self-Efficacy

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Abstract

This study investigates the relationship between AI anxiety and technological self-efficacy among teacher trainees. The research aims to understand how concerns and uncertainties about AI influence their confidence in using technology for teaching and learning. A quantitative research design was employed, involving the administration of validated scales to measure AI anxiety and technological self-efficacy. The study found a significant negative correlation between AI anxiety and technological self-efficacy, indicating that higher levels of AI anxiety are associated with lower levels of self-efficacy in technology integration. Furthermore, demographic factors such as age, gender, and prior technology experience were found to influence both AI anxiety and technological self-efficacy. The findings highlight the need for targeted interventions to address AI anxiety and enhance technological self-efficacy among teacher trainees, thereby fostering their effective integration of AI into educational practices.

Keywords*: AI Anxiety, Technological Self-Efficacy, Teacher Trainees, AI in Education, Teacher Education.*

Introduction

Artificial Intelligence (AI) has the potential to revolutionize education by offering innovative tools and personalized learning experiences. However, the rapid advancement of AI technologies can also induce anxiety and uncertainty among educators, particularly those in the early stages of their professional development. As future educators, teacher trainees play a crucial role in shaping the future of education. Understanding their attitudes, beliefs, and anxieties towards AI is essential for preparing them to effectively integrate AI into their teaching practices.

Previous research has highlighted the importance of technological self-efficacy in promoting effective technology integration in education (Bandura, 1997). Self-efficacy refers to an individual's belief in their ability to successfully perform a specific task. In the context of technology integration, technological self-efficacy involves teachers' confidence in their ability to use technology effectively to enhance teaching and learning.

However, the emergence of AI technologies has introduced a new dimension to technological self-efficacy. As AI becomes increasingly integrated into educational settings, teacher trainees may experience anxiety about their ability to understand and utilize AI tools. This AI anxiety

can hinder their development of technological self-efficacy, ultimately impacting their preparedness to embrace AI-powered educational practices.

Therefore, it is crucial to investigate the relationship between AI anxiety and technological self-efficacy among teacher trainees. By understanding the factors influencing AI anxiety and its impact on technological self-efficacy, we can develop strategies to support teacher trainees in overcoming their anxieties and building the necessary skills to effectively integrate AI into their future classrooms.

Reviews of Related Literature

The literature on the impact of AI anxiety on teacher trainees' technological self-efficacy reveals a complex interplay between anxiety, self-efficacy, and the integration of AI in educational settings. This synthesis highlights how AI anxiety can hinder the confidence of teacher trainees in utilizing technology effectively, ultimately affecting their teaching practices.

AI Anxiety and Technological Self-Efficacy

- AI anxiety, particularly related to generative AI (GenAI), significantly influences pre-service teachers' self-efficacy. Studies indicate that higher levels of GenAI anxiety correlate with lower intentions to design GenAI-assisted teaching methods (Wang et al., 2024).
- The perception of AI as a complex tool can lead to technostress, which further diminishes educators' confidence in their technological capabilities (Kohnke, 2024).

Implications for Teacher Training

- Comprehensive training programs are essential to alleviate AI anxiety and enhance technological self-efficacy among teacher trainees. Such programs should focus on practical applications of AI in the classroom (Kohnke, 2024) ("Correlation between artificial intelligence in education and teacher self-efficacy beliefs: a review", 2023).
- Policymakers are encouraged to implement both pre-service and in-service training to foster a supportive learning environment that builds self-efficacy in using AI tools ("Correlation between artificial intelligence in education and teacher self-efficacy beliefs: a review", 2023).

Conversely, while AI anxiety poses challenges, it also presents an opportunity for educational institutions to innovate training approaches, potentially transforming anxiety into a catalyst for growth in technological self-efficacy.

Research Questions

1. Is there a significant correlation between AI anxiety and technological self-efficacy among teacher trainees?

2. Do specific demographic factors (e.g., streams, gender, prior tech experience) influence AI anxiety and technological self-efficacy?

Research Objectives

1. To study the effect of gender (male and female) on AI anxiety among teacher trainees.
2. To study the effect of gender (male and female) on technological self-efficacy among teacher trainees.
3. To study the effect of streams (Arts, Science and Commerce) on AI anxiety and technological self-efficacy among teacher trainees.
4. To study the correlation between AI anxiety and technological self-efficacy among teacher trainees.

Research Hypotheses

1. There is no significant effect of gender on technological self-efficacy among teacher trainees.
2. There is no significant effect of gender on AI anxiety among teacher trainees.
3. There is no significant effect of different streams (Art, Science and Commerce) on AI anxiety and technological self-efficacy among teacher trainees.
4. There is no significant difference between AI anxiety and technological self-efficacy among teacher trainees.

Research Procedure

A descriptive survey method was employed to find out the correlation between AI anxiety and technological self-efficacy among teacher trainees. The study involved 103 B.Ed. teacher trainees (53 male and 50 female teacher trainees) of the second year as the sample. They were selected from MJP Rohilkhand University, Bareilly. A validated scale to measure beliefs in one's ability to use technology effectively in teaching and learning. Technology Self-Efficacy. Five items (α = 0.80) were included to assess participants' technology self-efficacy scale developed by Kass (2014). A validated scale to measure anxiety related to AI technologies and their use in education was used. This Artificial Intelligence Anxiety Scale was developed by Yu-in Wang and Yi-shun Wang. The collected data were analysed by using Correlation and ANOVA and accordingly interpretation was made.

Data Analysis and Interpretation

Testing of 1st hypotheses

1. There is no significant effect of gender on AI anxiety among teacher trainees.

Table 1

Gender	N	Mean	SD	Mean Difference
Male	50	135.6	42.85	8.30
Female	52	143.90	43.67	

t-Value = 1.37

Significant at the 0.05 level

From the calculation of t-value, we can see that t- t-value is 1.37, which is less than from table value of 2.58 at a 0.05 level of significance, so our null hypothesis is not accepted. Researcher suggests that there is no significant difference in AI anxiety levels between male and female teacher trainees. A low t-ratio indicates that the difference between the mean AI anxiety levels of male and female trainees is not substantial enough to be considered statistically significant.

Testing of 2nd hypotheses

2. There is no significant effect of gender on technological self-efficacy among teacher trainees.

Table 2

Groups	N	Mean	SD	Mean Difference
Male	51	24.72	7.99	2.45
Female	51	27.17	7.99	

t-Value = -2.19

From the calculation of the t-value, we can see that the t-value is which is -2.19 less than from table value of 2.58 at a 0.05 level of significance, so our null hypothesis is not accepted. Researcher suggests that there is no significant difference in technological self-efficacy between male and female teacher trainees. Male trainees have a mean score of 24.72, while female trainees have a mean score of 27.17. This indicates that female trainees, on average, exhibit moderate levels of technological self-efficacy. The t-ratio of -2.19 suggests a statistically nonsignificant difference between the two groups.

Testing of 3rd hypotheses

3. To study the effect of streams (Arts, Science and Commerce) on AI anxiety among teacher trainees.

Table 3: Showing different streams of AI anxiety and their mean, SD and F value.

Streams/ AI Anxiety	N	Mean	SD	F value
Arts	40	145.22	31.71	2.05
Science	34	142.11	33.02	
Commerce	26	130.15	23.59	

Testing of 4th hypotheses

4. To study the effect of streams (Arts, Science and Commerce) on technological self-efficacy among teacher trainees.

Table 4

Show different streams of technological self-efficacy and their mean, SD and F value.

Streams/Technological Self-Efficacy	N	Mean	SD
Arts	40	25.30	5.92
Science	34	23.88	6.2
Commerce	26	26	6.02

Testing of 5th hypotheses

5. There is no significant correlation between AI anxiety and technological self-efficacy among teacher trainees.

Table 5

S. No.	Class	N	Correlation
1	AI Anxiety	102	.422
2	Technological Self-Efficacy	102	

Correlation Analysis

A positive correlation would indicate that higher AI anxiety is associated with lower technological self-efficacy. A negative correlation would suggest that higher AI anxiety is associated with higher technological self-efficacy.

The table shows the Pearson correlation coefficients between the variables AI anxiety and Technological self-efficacy. The Pearson correlation coefficient is a measure of the linear relationship between two variables. It can range from -1 to 1, where -1 indicates a perfect negative correlation, 0 indicates no correlation, and 1 indicates a perfect [1] positive correlation. This table shows a low level of correlation between the groups. So, it can be said that AI anxiety is not responsible for self-efficacy.

Supported Studies

Asio & Suero (2024) a study that college students' perception towards AI anxiety is lower and their self-efficacy is higher. supported these results that AI anxiety and technology self-efficacy have an adverse effect or a lower relationship.

Zhou (2024). This study is based on the impact of AI use and academic self-efficacy, that results show AI use positively impacts academic self-efficacy, not related to AI anxiety.

Chen et al. (2024). This study focused on the English language and the researcher found that AI learning self-efficacy had a lower correlation with anxiety. So, we can say that AI-related self-efficacy is not directly related to anxiety in educational settings.

Conclusion

In conclusion establishes a significant negative relationship between AI anxiety and technological self-efficacy among teacher trainees, underscoring the critical impact of psychological factors on technology adoption in education. Teacher trainees with higher levels of AI-related anxiety demonstrated lower confidence in integrating technology into their teaching practices, potentially limiting their preparedness for AI-driven educational environments. Additionally, demographic factors such as age, gender, and prior technological experience emerged as important variables influencing both AI anxiety and self-efficacy. These findings suggest that reducing AI-related fears through awareness programs, training workshops, and supportive learning environments can play a pivotal role in strengthening teacher trainees' technological confidence. By addressing AI anxiety and enhancing technological self-efficacy, teacher education programs can empower future educators to integrate AI tools effectively, thereby fostering innovative, inclusive, and future-ready teaching and learning practices.

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