



Understanding Gender Dynamics in Teacher Educators' Computer Self-Efficacy

Rajni BALA*

Assistant Professor, Rama Devi Kanya Mahavidyalya, Noida, (U.P.) India

*Corresponding author: <drajni2016@gmail.com

Abstract

This study examines computer self-efficacy among teacher educators, defined as the confidence in one's ability to effectively utilize computer technology for educational purposes. The main aim is to investigate gender differences in self-efficacy across three competency levels: basic, intermediate, and advanced. Utilizing a quantitative research approach, a self-constructed questionnaire containing 35 items was distributed to a purposive sample of 100 teacher educators, which included 61 female and 39 male participants. T-tests were employed to analyze the differences in self-efficacy scores between genders. The findings indicate no significant difference in self-efficacy at the basic competency level ($t = 0.8391$). In contrast, female educators displayed significantly higher self-efficacy scores in intermediate ($t = 4.1417$) and advanced competencies ($t = 4.2159$). Furthermore, female educators achieved an average score of 142.62 on the overall computer self-efficacy scale, notably exceeding the average score of 117.28 for male educators ($t = 5.0717$). Thus, the study reveals important gender dynamics in computer self-efficacy among teacher educators. It indicates that female educators tend to have greater confidence in their computer skills as they advance in competency levels. This highlights the need to address gender disparities in professional development initiatives and suggests that further research should explore the underlying factors that influence self-efficacy in technology use among educators.

Keywords: computer, computer self-efficacy, teacher educators

Acknowledgments: Thank you to all parties who have participated in helping in the process until the completion of this research.

For citation:

Bala, R. (2024). Understanding Gender Dynamics in Teacher Educators' Computer Self-Efficacy. *Journal of Digital Learning and Distance Education*, 3(6), 1116-1121. <https://doi.org/10.56778/jdlde.v3i6.357>.

Introduction

In the 21st century, the face of education is increasingly improved by technological advancements that refine how teaching and learning occur. The spread of digital tools in classrooms ranging from interactive whiteboards to the latest online platforms demands that educators should not

only have the knowledge but should have the confidence to integrate them effectively into teaching practices. With the advent of digital changes, educators strive to incorporate technology into their teaching practices to enhance classroom instruction, create engaging lesson plans, and inspire their students. This confidence is embodied in the concept of computer self-efficacy which is defined as the belief of an individual in his capability or ability to successfully utilization of computer technology in an education setting. As teacher educators prepare future teachers to make use of technology-driven environments, it is very necessary to understand the dynamics of computer self-efficacy to nurture skilled and confident teachers. Teachers' attitudes toward ICT integration, their self-efficacy regarding technology use, and their skills in utilizing ICT are vital factors that influence the successful integration of technology in the classroom (Clipa et al., 2023). Many researchers emphasize that self-efficacy significantly impacts attitudes toward the integration and adoption of technology (Peng et al., 2024); (Getenet et al., 2024).

Teachers with higher levels of self-efficacy are more inclined to explore innovative teaching methods, while lower self-efficacy often leads to hesitation in using technology, which can limit the effectiveness of instruction. Additionally, self-efficacy in technology integration serves as a key predictor of individuals' intentions to use various software, while technological skills are crucial in predicting the frequency of future technology use (Anderson et al., 2011). Research indicates that there is no significant relationship between self-efficacy and teachers' attitudes toward the integration of ICT in teaching and learning. Given the vital role that teacher educators play in shaping future teachers, it is essential to evaluate their own self-efficacy in utilizing technology. One prominent factor influencing self-efficacy is gender. Traditionally, societal stereotypes have portrayed males as more proficient and comfortable with technology than females. This perception has contributed to the belief that men dominate the technology landscape. Research indicates that societal stereotypes and gender norms significantly shape individuals' beliefs about their technological capabilities, ultimately influencing their engagement and success in the field.

Several studies have shown that males generally report higher levels of computer efficacy compared to females. This trend is supported by findings from (Miura, 1987), which demonstrate that men tend to have a greater perception of their technological self-efficacy than women. However, research by suggests that gender does not significantly affect the technological self-efficacy of teachers. Interestingly, the comparable levels of self-efficacy in ICT usage among young male and female teachers are a promising sign that may lead to greater gender equality in other areas of ICT engagement (Ulfert-Blank & Schmidt, 2022). Overall, while there are notable gender differences in self-efficacy perceptions, these findings also indicate that the relationship between gender and technological self-efficacy can vary within specific contexts. Examining gender differences in computer self-efficacy is essential for understanding current dynamics and addressing potential disparities in professional development. As the education sector works towards equity, it is vital to empower both male and female educators to effectively utilize technology in their teaching. The main aim is to investigate gender differences in self-efficacy across three competency levels: basic, intermediate, and advanced.

Methodology

The present study employs a quantitative research methodology to investigate computer self-efficacy among teacher educators. A self-constructed questionnaire, consisting of 35 items was developed to assess three key dimensions of competency: basic, intermediate and advanced levels. The questionnaire was administered to a sample of 100 teacher educators which included 61 female and 39 male participants chosen through a purposive sampling technique. This method was selected to ensure that the participants had relevant experience and knowledge, allowing for a more targeted analysis of the research questions. Once the data were collected, statistical analyses were conducted using t-tests to evaluate differences in self-efficacy scores between various groups within the sample.

Results and Discussion

The results of this study can be seen in:

Mean Scores of Female and Male Teacher Educators on Basic Level of Competency Dimension of Computer Self-Efficacy Scale

Table 1. Mean Scores of Female and Male Teacher Educators on Basic Level of Competency Dimension of Computer Self-Efficacy Scale

Gender	Numbers	Mean	SD	t-value(df=98)
Female	61	56.18	10.74	0.8391
Male	39	54.12	14.16	

Table 1 displays the mean scores of female and male teacher educators on the Basic Level of Competency Dimension of the Computer Self-Efficacy Scale, including their standard deviations. The analysis involved 61 female educators, who had a mean score of 56.18, while the 39 male educators had a mean score of 54.12. The standard deviation for female educators was 10.74, indicating a moderate range of scores, whereas the male group exhibited a higher standard deviation of 14.16, reflecting greater variability in their results. With a t-value of 0.8391, the analysis shows no statistically significant difference between the two groups. Overall, these findings suggest that female and male teacher educators possess comparable levels of self-efficacy in basic computer competencies.

Mean Scores of Female and Male Teacher Educators on Intermediate Level of Competency Dimension of Computer Self-Efficacy Scale

Table 2. Mean Scores of Female and Male Teacher Educators on Intermediate Level of Competency Dimension of Computer Self-Efficacy Scale

Gender	Numbers	Mean	SD	t-value(df=98)
Female	61	44.43	9.09	t = 4.1417
Male	39	37.12	7.48	

Significant

Table 2 displays the mean scores of female and male teacher educators on the Intermediate Level of Competency Dimension of the Computer Self-Efficacy Scale along with their standard deviations and t-test results. The analysis included 61 female educators, who achieved mean score of 44.43, while the mean score for the 39 male educators was 37.12. Female educators had a standard deviation of 9.09 reflecting a broader range of scores compared to the male group which had a standard deviation of 7.48. The t-value of 4.1417 indicates a statistically significant difference between the two groups. These findings suggest that female teacher educators possess higher self-efficacy in intermediate computer competencies than their male counterparts.

Mean Scores of Female and Male Teacher Educators on Advance Level of Competency Dimension of Computer Self-Efficacy Scale

Table 3. Mean Scores of Female and Male Teacher Educators on Advance Level of Competency Dimension of Computer Self-Efficacy Scale

Gender	Numbers	Mean	SD	t-value(df=98)
Female	61	48.79	10.12	4.2159
Male	39	44.12	14.16	

Male	39	40.69	8.03
------	----	-------	------

Significant

Table 3 presents the mean scores of female and male teacher educators on the Advanced Level of Competency Dimension of the Computer Self-Efficacy Scale. The analysis involved 61 female teacher educators, who achieved a mean score of 48.79 compared to a mean score of 40.69 for the 39 male teacher educators. The standard deviation for female teacher educators was 10.12, indicating greater score variability than the male group which had a standard deviation of 8.03. A t-value of 4.2159 reflects a statistically significant difference between the two groups. These results suggest that female teacher educators demonstrate higher levels of self-efficacy in advanced computer competencies than their male counterparts.

Mean Scores of Female and Male Teacher Educators on Computer Self-Efficacy Scale

Table 4. Mean Scores of Female and Male Teacher educators on Computer Self-Efficacy Scale

Gender	Numbers	Mean	SD	t-value(df=98)
Female	61	142.62	26.55	t = 5.0717
Male	39	117.28	20.47	

Significant

Table 4 presents the mean scores of female and male teacher educators on the Computer Self-Efficacy Scale. The analysis included 61 female educators who scored an average of 142.62 with a standard deviation of 26.55 and 39 male educators who averaged 117.28 with a standard deviation of 20.47. A t-value of 5.0717 (with 98 degrees of freedom) shows a statistically significant difference, suggesting that female teacher educators demonstrate higher levels of computer self-efficacy than their male counterparts.

Discussion

The study's results highlight significant gender differences in computer self-efficacy among teacher educators across various competency levels.

- 1. Basic level of Competency
Female teacher educators scored slightly higher (mean = 56.18, SD = 10.74) than their male counterparts (mean = 54.12, SD = 14.16). However, the t-value of 0.8391 indicates that this difference is not statistically significant.
- 2. Intermediate Level of Competency
Female educators achieved a mean score of 44.43 (SD = 9.09), while male educators scored a mean of 37.12 (SD = 7.48). The t-value of 4.1417 indicates a statistically significant difference, suggesting that female teacher educators have higher self-efficacy in intermediate computer competencies.
- 3. Advanced level of Competency
At the advanced level, female teacher educators recorded a mean score of 48.79 (SD = 10.12), in contrast to male educators, who scored a mean of 40.69 (SD = 8.03). The t-value of 4.2159 reflects a statistically significant difference, indicating that female educators demonstrate greater self-efficacy in advanced computer competencies.
- 4. Overall Level of Competency
In terms of overall computer self-efficacy, female educators scored an average of 142.62 (SD = 26.55), which is significantly higher than the male educators' average of 117.28 (SD =

20.47). The t-value of 5.0717 signifies a strong statistically significant difference, reinforcing the pattern of higher self-efficacy among female teacher educators.

Although no notable differences were found at the basic competency level, this aligns with the findings of Pan (2020). In contrast, female educators demonstrated significantly higher self-efficacy in both intermediate and advanced competencies compared to their male counterparts. This contradicts the earlier findings of (Kalim & Bibi, 2024); (Liu et al., 2022); (Antera, 2023), suggesting a shift in confidence levels as female teacher educators progress to higher levels of competency. Overall, these findings suggest that female educators may exhibit greater confidence in their computer skills as they progress, underscoring the importance of professional development programs that support all educators (Theodorio, 2024); (Alieto et al., 2024); (Zamiri & Esmaeili, 2024); (Marzuki et al., 2023). It is crucial to address these gender dynamics to create an equitable educational environment where both male and female educators can excel in their use of technology. Future research should further investigate the factors influencing self-efficacy in technology among educators and examine the implications for teacher training programs (Nagy & Dringó-Horváth, 2024); (Dahri et al., 2023); (Luo & Li, 2024); (Yerdelen et al., 2024); (Wu et al., 2024); (Von Knebel et al., 2023). By understanding and addressing these dynamics, we can more effectively prepare future teachers for the challenges of a technology-driven (Haleem et al., 2022).

Conclusion

The findings of this study reveal significant gender dynamics in computer self-efficacy among teacher educators. In contrast, female educators demonstrated significantly higher self-efficacy in both intermediate and advanced competencies compared to their male counterparts. Overall, these findings suggest that female educators may exhibit greater confidence in their computer skills as they progress. It is crucial to address these gender dynamics to create an equitable educational environment where both male and female educators can excel in their use of technology. By understanding and addressing these dynamics, we can more effectively prepare future teachers for the challenges of a technology-driven.

Conflicts of Interest

The authors declare no conflict of interest.

References:

- Alieto, E., Abequibel-Encarnacion, B., Estigoy, E., Balasa, K., Eijansantos, A., & Torres-Toukoumidis, A. (2024). Teaching inside a digital classroom: A quantitative analysis of attitude, technological competence and access among teachers across subject disciplines. *Heliyon*, 10(2), e24282. <https://doi.org/10.1016/j.heliyon.2024.e24282>
- Anderson, S. E., Groulx, J. G., & Maninger, R. M. (2011). Relationships among Preservice Teachers' Technology-Related Abilities, Beliefs, and Intentions to Use Technology in Their Future Classrooms. *Journal of Educational Computing Research*, 45(3), 321–338. <https://doi.org/10.2190/EC.45.3.d>
- Antera, S. (2023). Competence importance and acquisition: Comparing qualified and non-qualified vocational teachers. *Journal of Education and Work*, 36(2), 109–124. <https://doi.org/10.1080/13639080.2023.2167956>
- Clipa, O., Delibas, C.-S., & Măță, L. (2023). Teachers' Self-Efficacy and Attitudes towards the Use of Information Technology in Classrooms. *Education Sciences*, 13(10), 1001. <https://doi.org/10.3390/educsci13101001>
- Dahri, N. A., Al-Rahmi, W. M., Almogren, A. S., Yahaya, N., Vighio, M. S., Al-maatuok, Q., Al-Rahmi, A. M., & Al-Adwan, A. S. (2023). Acceptance of Mobile Learning Technology by

- Teachers: Influencing Mobile Self-Efficacy and 21st-Century Skills-Based Training. *Sustainability*, 15(11), 8514. <https://doi.org/10.3390/su15118514>
- Getenet, S., Cante, R., Redmond, P., & Albion, P. (2024). Students' digital technology attitude, literacy and self-efficacy and their effect on online learning engagement. *International Journal of Educational Technology in Higher Education*, 21(1), 3. <https://doi.org/10.1186/s41239-023-00437-y>
- Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, 3, 275–285. <https://doi.org/10.1016/j.susoc.2022.05.004>
- Kalim, U., & Bibi, S. (2024). Assessing Teacher Competencies in Public Schools of Pakistan: A Pathway for Improving the Effectiveness of Professional Development Programs for Teachers. *Sage Open*, 14(2), 21582440241236060. <https://doi.org/10.1177/21582440241236060>
- Liu, Y., Zhao, L., & Su, Y.-S. (2022). The Impact of Teacher Competence in Online Teaching on Perceived Online Learning Outcomes during the COVID-19 Outbreak: A Moderated-Mediation Model of Teacher Resilience and Age. *International Journal of Environmental Research and Public Health*, 19(10), 6282. <https://doi.org/10.3390/ijerph19106282>
- Luo, Z., & Li, H. (2024). Competence, preparation, and relaxation: Contributing factors to EFL student teachers' self-efficacy and teaching performance in microteaching training. *Heliyon*, 10(4), e26216. <https://doi.org/10.1016/j.heliyon.2024.e26216>
- Marzuki, Widiati, U., Rusdin, D., Darwin, & Indrawati, I. (2023). The impact of AI writing tools on the content and organization of students' writing: EFL teachers' perspective. *Cogent Education*, 10(2), 2236469. <https://doi.org/10.1080/2331186X.2023.2236469>
- Miura, I. T. (1987). The relationship of computer self-efficacy expectations to computer interest and course enrollment in college. *Sex Roles*, 16(5–6), 303–311. <https://doi.org/10.1007/BF00289956>
- Nagy, J. T., & Dringó-Horváth, I. (2024). Factors Influencing University Teachers' Technological Integration. *Education Sciences*, 14(1), 55. <https://doi.org/10.3390/educsci14010055>
- Peng, R., Razak, R. A., & Halili, S. H. (2024). Exploring the role of attitudes, self-efficacy, and digital competence in influencing teachers' integration of ICT: A partial least squares structural equation modeling study. *Heliyon*, 10(13), e34234. <https://doi.org/10.1016/j.heliyon.2024.e34234>
- Theodorio, A. O. (2024). Examining the support required by educators for successful technology integration in teacher professional development program. *Cogent Education*, 11(1), 2298607. <https://doi.org/10.1080/2331186X.2023.2298607>
- Ulfert-Blank, A.-S., & Schmidt, I. (2022). Assessing digital self-efficacy: Review and scale development. *Computers & Education*, 191, 104626. <https://doi.org/10.1016/j.compedu.2022.104626>
- Von Knebel, K., Schroeder, S., & Bögeholz, S. (2023). Factors influencing self-efficacy beliefs of interdisciplinary science teaching – the role of teaching experience, science subjects studied, and desire to teach interdisciplinary science. *Frontiers in Education*, 8, 1147441. <https://doi.org/10.3389/feduc.2023.1147441>
- Wu, X.-N., Liao, H.-Y., & Guan, L.-X. (2024). Examining the influencing factors of elementary and high school STEM teachers' self-efficacy: A meta-analysis. *Current Psychology*, 43(31), 25743–25759. <https://doi.org/10.1007/s12144-024-06227-7>
- Yerdelen, S., Tas, Y., & Osmanoglu, A. (2024). Investigating the change in prospective science teachers' self-efficacy beliefs and the sources of this change during the teaching practice course. *Frontiers in Education*, 9, 1427513. <https://doi.org/10.3389/feduc.2024.1427513>
- Zamiri, M., & Esmaeili, A. (2024). Methods and Technologies for Supporting Knowledge Sharing within Learning Communities: A Systematic Literature Review. *Administrative Sciences*, 14(1), 17. <https://doi.org/10.3390/admsci14010017>