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Examining Technology Self-Efficacy in Indonesian EFL Classrooms: Insights from Secondary School English Teachers

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Abstract

Teachers' technology self-efficacy significantly influences their ability to effectively adopt and utilize digital tools. However, many secondary school English teachers in Indonesia still face challenges adapting to technology, which may hinder their ability to integrate digital tools into their teaching practices. While existing studies primarily focus on teachers' perceptions, professional agency, and general challenges in technology integration, few explore how demographic factors—such as gender, age, education level, and teaching experience—affect technology self-efficacy among Indonesian secondary school English teachers. A descriptive quantitative design was employed, utilizing statistical analysis to interpret the data. The study involved 29 secondary school English teachers from the Jatinom English Teachers Association (JETA), Klaten, Central Java, Indonesia. Data were collected using the Technology Self-Efficacy Scale (Wang et al., 2004) via Google Forms. The findings revealed that teachers' technology self-efficacy was moderate overall. Male teachers aged 26-30 demonstrated higher confidence in ICT usage. Additionally, teachers with a Bachelor's degree exhibited higher technology self-efficacy than those with a Master's degree, suggesting that formal education level alone does not directly influence confidence in using technology. Furthermore, teachers with 11-15 years of experience reported the highest self-efficacy, while those with 1-5 years of experience had the lowest, indicating that teaching experience alone is not a strong determinant of technology self-efficacy. These results highlight the need for improved ICT infrastructure and professional development training to enhance teachers' confidence and skills in technology use.

Keywords: Technology self-efficacy, ICT, EFL teachers, secondary school, Indonesia.

INTRODUCTION

Technology integration in education has become increasingly essential, particularly in English as a Foreign Language (EFL) instruction, where digital tools can enhance learning experiences, promote student engagement, and provide access to diverse resources. Studies have indicated that technology adoption in EFL classrooms is positively associated with improved learning outcomes and digital literacy skills (Lisia et al., 2024; Kessler, 2018). Technology-infused instruction fosters individualized learning experiences, allowing

students to develop linguistic proficiency at their own pace (Waluyo, 2021). Beyond improving access to authentic language materials, ICT enables interactive and multimodal learning experiences, incorporating gamification, real-time feedback, and virtual simulations (Alam & Mohanty, 2023; Bai et al., 2022; Abdulrahman et al., 2020). As technology continues to reshape the educational landscape, the ability of both teachers and students to effectively utilize digital tools has become a critical factor in achieving meaningful language learning outcomes. This shift toward digital learning highlights the growing importance of Information and Communication Technology (ICT) in modern language education.

In the Indonesian EFL context, where technology adoption is still developing, efforts to implement technology-enhanced learning have encouraged teachers to integrate ICT into their instructional practices. However, the extent to which technology is successfully adopted varies considerably. While students often perceive ICT as a transformative tool for learning, their experiences depend on their level of technological exposure and digital fluency (Suratno & Aydawati, 2017). At the same time, effective ICT integration in classrooms is heavily influenced by infrastructure availability, digital access, and teachers' familiarity with technological tools (Salam et al., 2020; Ifinedo & Kankaanranta, 2021). Although ICT literacy is increasingly emphasized in Indonesian EFL curricula, many teachers still struggle with its practical implementation due to inadequate training and hesitancy (Marzuki et al., 2024; Apriani et al., 2022). These challenges contribute to disparities in technology self-efficacy, raising concerns about whether all educators have equal opportunities to develop the digital competence necessary for effective teaching.

A key determinant of successful technology integration is teachers' technology self-efficacy—their confidence in using digital tools for instructional purposes. According to Corporan et al. (2020), teachers' proficiency in navigating technological tools is crucial in shaping their willingness to adopt ICT-based teaching methodologies. Those with high self-efficacy are more likely to experiment with new technologies, troubleshoot challenges, and apply digital resources meaningfully (Clipa et al., 2023). Conversely, teachers with low self-efficacy may avoid technology use, perceive digital integration as an added burden, or struggle to adapt to evolving educational demands (Tilton & Hartnett, 2016; Kwon et al., 2019). Moreover, technology self-efficacy is not uniform across all educators. For instance, research findings by Yavich and Davidovitch (2021) and Gudmundsdottir and Hatlevik (2017) suggest that younger teachers are more comfortable with digital tools due to greater exposure. In contrast, more experienced educators often rely on traditional teaching methods and may be less inclined to embrace new technologies. Similarly, teachers with advanced degrees have had more opportunities to develop their technological skills compared to those with lower formal education (Liesa-Orús et al., 2020; Galindo-Domínguez & Bezanilla, 2021; Cabero-Almenara et al., 2021).

Self-efficacy, a concept introduced by Bandura (1977) in Social Cognitive Theory, is all about a person's belief in their ability to complete tasks and reach their goals. It plays a big role in shaping motivation, behavior, and perseverance, influencing how people set goals, handle challenges, and keep going despite setbacks (Bandura, 1997). In education, a teacher's self-efficacy has a direct impact on their teaching style, classroom management, and willingness to try new approaches. Teachers with strong self-efficacy tend to be more flexible, proactive, and open to innovation, while those with lower self-efficacy may struggle

with anxiety, resist change, and hesitate to experiment with new teaching methods (Klassen & Durksen, 2015; Zee & Koomen, 2016).

Self-efficacy develops through four key experiences: mastering tasks and building confidence, learning by watching others succeed, receiving encouragement from peers and mentors, and managing emotions like stress and anxiety (Bandura, 1994; Morris et al., 2017). In today's digital age, self-efficacy also includes confidence in using technology, which is essential for integrating digital tools into the classroom. Supporting and strengthening teachers' self-efficacy is crucial, not only for their own growth, but also for improving teaching quality, embracing technology in education, and ultimately enhancing student learning.

Several studies have examined the factors affecting teachers' technology self-efficacy, revealing gaps between perception and practice and the need for professional development and institutional support. Rabbianty et al. (2024) found that English lecturers in East Java exhibited moderate self-efficacy in using educational technology, with age, gender, qualifications, and experience as key influencing factors. Similarly, Pratama et al. (2024) revealed that Indonesian EFL teachers had a highly positive perception of Intelligent Computer-Assisted Language Learning (ICALL). However, their self-efficacy remained low due to limited computer and AI-operation skills, emphasizing the need for professional development programs. Meanwhile, Rigi (2015) identified a mismatch between Iranian EFL teachers' perceived self-efficacy and their actual technology use, with both external (institutional support) and personal (digital competence) factors affecting technology integration. Utami and Kuswandono (2023) explored Indonesian EFL teachers' agency and self-efficacy, revealing that institutional challenges persist while many engage in professional development. Similarly, Nugroho and Mutiaraningrum (2020) highlighted the gap between Indonesian EFL teachers' beliefs and their technology integration, attributing hesitancy to inadequate training and limited resources. Supporting this, Setyaningsih et al. (2020) found that Indonesian teachers generally held positive attitudes toward technology use. However, their integration practices were often limited to substitution and augmentation, lacking more profound pedagogical transformation.

While efforts to integrate ICT in Indonesian EFL classrooms continue, disparities in technology self-efficacy remain unexplored. Existing studies focus on teachers' perceptions, professional agency, and general technology integration challenges. However, few examine how gender, age, education level, and teaching experience influence technology self-efficacy among Indonesian secondary school English teachers. This study's novelty lies in its focus on secondary school English teachers and the demographic factors affecting their technology self-efficacy, an area underexplored in the Indonesian context. Unlike prior research, which centres on higher education lecturers or institutional challenges, this study adopts a quantitative approach to assess self-efficacy variations based on teacher demographics. Thus, this study aims to investigate the levels of technology self-efficacy among Indonesian secondary school English teachers and analyze how demographic factors impact their confidence in digital tool integration, providing insights for targeted professional development and policy improvements.

METHOD

This study adopted a descriptive quantitative research approach, utilizing statistical analysis to examine and categorize various factors (Creswell & Creswell, 2018). This research design is particularly useful for analyzing trends, identifying patterns, and classifying data based on measurable characteristics (Fraenkel et al., 2019). The rationale behind choosing this method lies in its ability to objectively assess English teachers' self-efficacy in using technology.

The study focused on secondary school English teachers in Jatinom, Klaten, Central Java, Indonesia, who are active members of the Jatinom English Teachers Association (JETA). This population was selected because they represent experienced educators in the field of EFL, particularly in a region where integrating technology into education is still an evolving practice. A total of 29 secondary school English teachers participated in the study, chosen through purposive sampling. This method allowed researchers to select individuals based on specific criteria relevant to the study (Staller, 2021), ensuring that all participants were actively engaged in English instruction and had some level of experience incorporating technology into their teaching. The sample size was determined based on both practicality and availability while maintaining the validity and reliability required for statistical analysis (Cohen et al., 2018).

To measure technology self-efficacy among these teachers, the study employed the Technology Self-Efficacy Scale (TSES) developed by Wang et al. (2004). The questionnaire was distributed via Google Forms and underwent a pilot test involving 20 teachers outside the main study sample. This step was taken to verify its validity and reliability (Creswell & Creswell, 2018). The instrument's reliability was assessed using SPSS, yielding a Cronbach's alpha coefficient of 0.973, which indicates excellent internal consistency and confirms its effectiveness in measuring technology self-efficacy (Field, 2017).

For data analysis, the study employed quantitative techniques to examine technology self-efficacy levels and explore the influence of demographic factors such as gender, age, educational background, and teaching experience. The collected data, derived from the TSES, were processed and analyzed using SPSS version 26, a widely recognized software known for its precision in handling quantitative research data (Pallant, 2020).

To determine whether demographic factors significantly influenced teachers' technology self-efficacy, the study applied inferential statistical analyses, including independent sample t-tests and one-way ANOVA (Analysis of Variance). The independent sample t-test was used to compare mean differences between two groups, such as male and female teachers, to assess whether gender played a role in self-efficacy levels (Cohen et al., 2018). Meanwhile, one-way ANOVA was conducted to analyze variations in self-efficacy scores across multiple demographic groups, including different age brackets, educational backgrounds, and levels of teaching experience (Pallant, 2020). If ANOVA results revealed statistically significant differences, post-hoc tests such as Tukey's HSD were performed to identify which specific groups differed. The results were evaluated based on a significance threshold (p-value < 0.05) to determine the presence of meaningful differences (Tabachnick & Fidell, 2019).

FINDING AND DISCUSSION

This section presents the demographic profile of the 29 secondary school English teachers who took part in this study. The data cover key aspects such as gender, age, educational background, and teaching experience, offering valuable context for understanding differences in technology self-efficacy levels among participants.

Table 1. Demographic of the respondents

Aspects	Demographic status	N	Percentage (%)
Gender	Male	4	13.8
	Female	25	86.2
Age	26-30 years old	1	3.4
	31-35 years old	5	17.2
	36-40 years old	10	34.5
	41-45 years old	5	17.2
	46-50 years old	5	17.2
	> 51 years old	3	10.3
Level of education	Bachelor Degree	26	89.7
	PPG (Teacher Professional Education)	1	3.4
	Master Degree	2	6.9
Teaching experience	1-5 years	2	6.9
	6-10 years	8	27.6
	11-15 years	5	17.2
	16-20 years	6	20.7
	> 21 years	8	27.6

Table 1 presents the demographic characteristics of the 29 secondary school English teachers who participated in this study. In terms of gender, the majority of respondents were female (86.2%), while male teachers accounted for 13.8% of the sample. Regarding age distribution, the most significant proportion of teachers fell within the 36-40 age group (34.5%), followed by those aged 31-35 (17.2%), 41-45 (17.2%), and 46-50 (17.2%), while only a small number were aged 26-30 (3.4%) or above 51 years old (10.3%). In terms of educational background, most participants held a Bachelor's degree (89.7%), while a smaller percentage had completed Teacher Professional Education (PPG) (3.4%) or held a Master's degree (6.9%). Additionally, respondents varied in teaching experience, with 27.6% having 6-10 years of experience and another 27.6% having over 21 years of experience. Teachers with 16-20 years (20.7%), 11-15 years (17.2%), and 1-5 years (6.9%) of experience were also represented. These demographic details provide essential context for understanding the diversity in teachers' backgrounds and their potential influence on technology self-efficacy levels in secondary school English instruction.

Table 2. Comparison of technology self-efficacy scores by gender

Gender	Mean ($\bar{x}$)	N	Std. Deviation	T-Test (p-value)
Male	72.75	4	6.898	0.68
Female	62.84	25	9.969	

The results of the independent samples t-test comparing technology self-efficacy scores between male and female teachers are presented in Table 2. The descriptive statistics show that male teachers (M = 72.75, SD = 6.898, N = 4) reported higher self-efficacy scores than female teachers (M = 62.84, SD = 9.969, N = 25). However, the t-test result (p = 0.68) indicates that this difference is not statistically significant, as the p-value is greater than 0.05, suggesting that gender does not significantly influence technology self-efficacy in this study.

The results indicate that gender does not significantly influence technology self-efficacy among secondary school English teachers, as evidenced by the t-test results (p = 0.68). Although male teachers in this study reported higher mean self-efficacy scores than female teachers, the lack of statistical significance suggests that gender alone is not a decisive factor in shaping teachers' confidence in technology integration. This aligns with previous research indicating that self-efficacy in technology use is more strongly associated with experience, training, and institutional support rather than gender differences (Cai et al., 2016; Šabić et al., 2021; Subekti & Sinaga, 2024). Moreover, while some studies suggest that female teachers may experience higher levels of computer anxiety (Gröstenberger & Selinger, 2023), others argue that structured exposure to digital tools helps reduce gender disparities in technology-related self-efficacy over time (Hanham et al., 2021; Gnambs, 2020). Furthermore, the limited impact of gender on technology self-efficacy in this study supports the notion that institutional factors such as workplace policies and digital access may be more influential than inherent gender differences (Siddiq & Scherer, 2016; Hennessy et al., 2022).

Table 3. Comparison of technology self-efficacy scores by age

Age	Mean ($\bar{x}$)	N	Std. Deviation	ANOVA
26-30	80.00	1	.	
31-35	67.80	5	10.134	
36-40	65.20	10	7.757	0.001
41-45	70.20	5	7.362	
46-50	60.60	5	4.827	
> 51	45.67	3	1.528	

Table 3 presents the descriptive statistics and ANOVA results for technology self-efficacy scores across different age groups. The findings indicate that younger teachers generally demonstrate higher confidence in using technology for teaching, with the 26-30 age group recording the highest mean score (M = 80.00, N = 1), though this result should be interpreted cautiously due to the small sample size. Among larger groups, teachers aged 41-45 reported relatively strong self-efficacy (M = 70.20, SD = 7.362, N = 5), followed by those aged 31-35 (M = 67.80, SD = 10.134, N = 5) and 36-40 (M = 65.20, SD = 7.757, N = 10). In contrast, teachers aged 46-50 (M = 60.60, SD = 4.827, N = 5) and those over 51 years old (M = 45.67, SD = 1.528, N = 3) exhibited the lowest self-efficacy levels, suggesting that older educators may face challenges in integrating technology into their teaching practices.

The ANOVA results (Sig = 0.001) indicate a statistically significant difference in self-efficacy scores across age groups, confirming that age influences teachers' confidence in using technology. A post-hoc test, such as Tukey's HSD, would be necessary to determine which specific groups differ significantly. These results suggest that younger teachers may

benefit from greater exposure to digital tools and technology-driven teaching methods, while older educators may have had fewer opportunities for professional development in this area. The significant variation in self-efficacy highlights the need for targeted training programs to support teachers in adapting to digital education, ensuring that all educators, regardless of age, can effectively integrate technology into their instructional practices.

This aligns with existing literature suggesting that younger educators are generally more comfortable with technology due to their greater exposure to digital tools and more frequent engagement with technology-driven professional development (Ertmer & Ottenbreit-Leftwich, 2014; Tondeur et al., 2018). Digital literacy, early exposure to technology, and opportunities to integrate digital tools into their teaching practices may contribute to higher self-efficacy levels among younger teachers (Corporan et al., 2020; Getenet et al., 2024; Akayoglu et al., 2019). Conversely, the decline in self-efficacy among older teachers may be attributed to several factors, including limited prior exposure to digital tools, a lack of structured technology training earlier in their careers, and potential resistance to adopting new instructional technologies (Peng et al., 2023; Kraus et al., 2021). Additionally, older teachers may experience more challenges adapting to rapidly evolving digital platforms, leading to lower confidence in their ability to integrate technology effectively into their teaching. The findings reinforce the argument that self-efficacy in technology use is not solely determined by access to digital tools but also by one's familiarity, training, and attitudes toward technology. (Pan, 2020; Nordlöf et al., 2017).

Table 4. Comparison of technology self-efficacy scores by education level

Education level	Mean ($\bar{x}$)	N	Std. Deviation	ANOVA
Bachelor Degree	64.96	26	9.885	
PPG	64.00	1	-	0.384
Master Degree	54.50	2	14.849	

Table 4 presents the descriptive statistics and ANOVA results for technology self-efficacy scores across different educational levels. The descriptive statistics indicate that teachers with a Bachelor's degree had the highest mean technology self-efficacy score (M = 64.96, SD = 9.885, N = 26), followed by those with Teacher Professional Education (PPG) certification (M = 64.00, N = 1). Meanwhile, teachers with a Master's degree reported the lowest mean self-efficacy score (M = 54.50, SD = 14.849, N = 2). However, the PPG category consists of only one respondent (N = 1), making it difficult to draw meaningful conclusions about this group.

The ANOVA test result (Sig = 0.384) indicates no statistically significant difference in technology self-efficacy scores across the different education levels, as the p-value is greater than 0.05. The absence of a statistically significant difference across educational levels suggests that formal academic qualifications alone may not be a primary determinant of technology self-efficacy. This aligns with previous research emphasizing that practical experience, hands-on technology training, and frequent exposure to digital tools substantially shape teachers' confidence in technology integration (Zhang, 2022; Falloon, 2020; Tondeur et al., 2016). It is possible that teachers at all educational levels encounter similar challenges when incorporating technology into their teaching and that their confidence levels depend more on access to training and personal engagement with digital

tools rather than the highest degree attained (Ghavifekr et al., 2016; Lawrence and Tar, 2018). Interestingly, the lower self-efficacy scores among teachers with a Master's degree may reflect a greater awareness of advanced technological demands or a lack of targeted training in technology integration at the postgraduate level. Blau et al. (2019) and Anthonysamy et al. (2020) suggest that higher education programs often focus more on theoretical and pedagogical aspects than hands-on digital literacy training. Consequently, even highly qualified teachers may not feel confident using technology unless they have received structured, practical training.

These findings highlight the need for ongoing professional development initiatives tailored to teachers at all educational levels. While academic qualifications provide a foundation for teaching expertise, structured and practice-based technology training is crucial in building self-efficacy (Kruskopf et al., 2024). Professional development programs should prioritize hands-on workshops, peer mentoring, and continuous exposure to digital tools to ensure that teachers feel confident in integrating technology effectively regardless of their educational background.

Table 5. Comparison of technology self-efficacy scores by teaching experience

Teaching experience	Mean ($\bar{x}$)	N	Std. Deviation	ANOVA
1-5	58.50	2	9.192	0.445
6-10	66.87	8	9.031	
11-15	69.20	5	7.791	
16-20	64.17	6	7.278	

Table 5 presents the descriptive statistics and ANOVA results comparing technology self-efficacy scores across different teaching experience groups. The descriptive statistics indicate that teachers with 11-15 years of experience had the highest mean technology self-efficacy score (M = 69.20, SD = 7.791, N = 5), followed by those with 6-10 years of experience (M = 66.87, SD = 9.031, N = 8). Teachers with 16-20 years of experience reported a slightly lower mean (M = 64.17, SD = 7.278, N = 6), while those with 1-5 years of experience had the lowest self-efficacy scores (M = 58.50, SD = 9.192, N = 2).

The ANOVA test result (Sig = 0.445) suggests no statistically significant difference in self-efficacy scores based on teaching experience, as the p-value is more significant than 0.05. Although there are differences in self-efficacy levels among teachers with varying years of experience, the absence of statistical significance indicates that teaching experience alone does not strongly influence technology self-efficacy. This finding is consistent with prior research suggesting that confidence in using technology is more dependent on factors like digital exposure, access to professional development, and institutional support rather than the number of years spent teaching (Bowman et al., 2020; Xie et al., 2017). Teachers with moderate experience (6-15 years) demonstrated slightly higher self-efficacy, likely due to increased familiarity with digital tools, continued professional learning, or gradual adaptation to technological advancements rather than experience itself (Avidov-Ungar & Forkosh-Baruch, 2018). The relatively low self-efficacy scores among teachers with 1-5 years of experience suggest that early-career educators may not feel fully confident in integrating technology into their teaching despite being part of a digital generation. This

could stem from inadequate training in technology integration during their teacher preparation programs or limited support during their initial teaching years (Francom, 2019; Akram et al., 2022). Meanwhile, teachers with 16-20 years of experience showed moderate self-efficacy, reinforcing the idea that experience alone does not necessarily equate to greater confidence in technology use (Alenezi, 2017).

These findings reinforce the need for continuous, structured professional development programs tailored to teachers at all experience levels. Instead of assuming that experience translates into higher technology self-efficacy, institutions should prioritize ongoing training programs focusing on hands-on practice, peer collaboration, and pedagogical applications of digital tools. Schools and policymakers should ensure that teachers, regardless of their professional years, have equal opportunities to enhance their digital competencies through workshops, mentorship programs, and access to instructional technology resources. Future research could explore the interplay between teaching experience and other factors such as institutional support, individual attitudes toward technology, and prior technology-related training. Additionally, qualitative insights from teachers across different experience levels could provide deeper perspectives on the specific challenges and support needed to improve technology self-efficacy. A longitudinal approach tracking changes in self-efficacy over time could also offer valuable insights into how professional development interventions impact teachers' confidence in using technology.

CONCLUSION

This study found that secondary school teachers generally exhibited a moderate level of technology self-efficacy. The results indicated that male teachers aged 26-30 showed greater confidence in using ICT. Additionally, teachers with a Bachelor's degree reported higher self-efficacy compared to those with a Master's degree, suggesting that formal education level alone does not directly determine confidence in technology use. Moreover, teachers with 11-15 years of experience demonstrated the highest self-efficacy, while those with 1-5 years had the lowest, implying that teaching experience alone is not a definitive factor in shaping technology self-efficacy.

The implications of these findings highlight the importance of institutional support in enhancing teachers' digital competencies. Since technology self-efficacy is influenced by factors beyond age, education level, and teaching experience—such as exposure to digital tools, access to professional development, and institutional support—schools must provide appropriate ICT infrastructure and continuous training tailored to teachers at all experience levels. Structured professional development programs, hands-on training, and ongoing technical support are essential to ensure that all teachers can integrate ICT effectively into their teaching practices, regardless of their background. Future research could explore additional factors influencing teachers' self-efficacy, such as digital literacy training, school policies, and attitudes toward technology, to provide deeper insights into strategies for improving technology integration in education.

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