



From Anxious to Assured: A Professional Development Program Unraveling the Transformative Power of Technology Integration for Pre-Service and In-Service EFL Teachers

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Received: 2023/10/17

Accepted: 2024/01/30

Abstract: Technology integration has become increasingly significant in educational contexts, offering promising opportunities for the professional development of teachers, including EFL teachers. This study explored the transformative potential of integrating technology in the professional development of pre-service and in-service EFL teachers in schools, institutes, and universities. The research objective was to examine the impact of technology integration on teachers' anxiety levels and pedagogical practices. Forty-six pre- and in-service teachers (n=23 per group) participated in a comprehensive 10-session professional development program. The procedure included pre-testing the participants for anxiety levels, conducting the program (twice a week; from January to February, 2023), and administering post-tests after a one-semester interval (May, 2023) to assess changes in the teachers' anxiety levels and pedagogical practices. The quantitative and qualitative findings revealed the compelling benefits of technology integration for the pre-service teachers, as they reported lower anxiety levels and a significant boost in confidence when selecting and utilizing appropriate technological tools, designing engaging digital activities, and effectively managing technology-related challenges. Conversely, the in-service teachers experienced no significant reduction in anxiety. Moreover, they reported fewer advantages from technology integration and tended to adhere to traditional teaching methods, predominantly due to the challenges of altering established instructional strategies. The findings underscore the critical role of prioritizing professional development for in-service teachers, considering their pivotal role in shaping the future landscape of education. Dedicated efforts should be aimed at supporting teachers to integrate technology effectively, foster better teaching practices, and facilitate optimal learning outcomes for EFL students.

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Keywords: Pre-service EFL Teacher, In-service EFL Teacher, Anxiety, Technology Integration, Teacher Anxiety Scale (TAS).

Introduction

Technological advancements have revolutionized the educational landscape, presenting new opportunities for teachers to enhance their instructional approaches and create engaging learning environments. Technology integration in EFL classrooms holds particular significance, as it can facilitate language acquisition, foster learner autonomy, and prepare students for the demands of a globalized world (Horwitz, 2001). However, for EFL teachers to effectively harness the potential of technology, comprehensive professional development initiatives that address their unique needs and challenges are imperative.

This study explored the transformative potential of technology integration in the professional development of pre-service and in-service EFL teachers operating within various educational settings, such as schools, institutes, and universities. Through an investigation into how technology integration affects teachers' anxiety levels and teaching methods, this study offers significant perspectives on the obstacles and difficulties related to the incorporation of technology in language education.

The rationale behind this study stems from the recognition that EFL teachers often experience anxiety and apprehension when confronted with incorporating technology into their pedagogical practices. This anxiety may arise from a lack of technological literacy, concerns about technological disruptions, or uncertainties regarding the effectiveness of technology-enhanced teaching approaches (Celik & Yesilyurt, 2013; Henderson & Corry, 2021). Consequently, it is crucial to address these concerns and empower EFL teachers to adopt technology as a powerful tool for enhancing their teaching practices. The study would contribute to meaningful perspectives and suggestions for the successful integration of technology in EFL teacher professional development initiatives, acknowledging the significance of technology in shaping the future of language education.

Research Background

Teacher Anxiety

Anxiety is a complex psychological state characterized by feelings of apprehension, worry, and unease. Anxiety disorders are among the most prevalent mental health conditions, affecting a considerable portion of the population worldwide. These disorders encompass a range of conditions, such as generalized anxiety disorder, social anxiety disorder, panic disorder, and specific phobias (Hettema, 2008). The symptoms associated with anxiety

disorders can significantly interfere with individuals' personal and professional lives, leading to impairments in various areas, including work performance, relationships, and overall quality of life (Alrabai, 2015; Bandelow & Michaelis, 2015).

Understanding the nature of anxiety and its impact on individuals is crucial for clinical practice and research. Numerous studies have explored the cognitive, physiological, and behavioral aspects of anxiety, shedding light on its underlying mechanisms and potential treatment approaches (Creswell et al., 2013; Davies et al., 2015; Kim & Gorman, 2005). Furthermore, recognizing individual differences in anxiety experiences and the contextual factors contributing to anxiety can inform the development of effective interventions and support strategies (Zalta & Chambless, 2012).

Anxiety in education has been recognized as a significant factor affecting students' learning experiences, academic performance, and overall well-being (Putwain et al., 2010). Researchers have investigated the impact of test, social, and performance anxiety on students' educational outcomes, highlighting the importance of creating supportive learning environments and implementing appropriate interventions to alleviate anxiety-related distress (Zeidner, 1998).

Teacher anxiety (i.e., feelings of apprehension, stress, and unease experienced by educators in the classroom) as a pervasive phenomenon has been the focus of numerous studies in the field of education (Celik & Yesilyurt, 2013; Hauser et al., 2012; Hermens & Mazzeo, 1995). Previous research has explored the prevalence and effects of anxiety among teachers (Coates & Thoresen, 1976; Ozamiz-Etxebarria et al., 2021; Pressley et al., 2021; Sinclair & Ryan, 1987), shedding light on various factors and developmental progressions associated with this phenomenon.

While knowledge and teaching methods are important, some researchers (Abbasi-Asl et al., 2016; O'Leary-Barrett et al., 2013) argue that teachers' 'personality' and 'mental health' reflected in classroom behavior hold greater significance. The impact of stress, tension, or anxiety on teachers' personalities and behavior has often been overlooked despite previous studies indicating that teachers experience considerable strain, tension, or anxiety in the classroom (Wiley, 2000). Understanding the potential adverse effects on students is crucial, as anxiety among teachers can affect millions of students (Englehart, 2009).

Anxiety levels and concerns vary between beginning and experienced teachers (Cakmak, 2008). Beginning teachers commonly experience tension related to relationships with master teachers and college supervisors, feedback on teaching sessions, discipline

maintenance, student approval, subject matter knowledge, handling mistakes, and establishing relationships with faculty, the school system, and parents (Denmark & Podsen, 2013; Feiman-Nemser, 1989; Volkmann & Anderson, 1998).

Experienced teachers, on the other hand, report concerns associated with time demands (Klassen & Anderson, 2009), pupil difficulties (Freitas et al., 2004), large class enrollments (Gibbs & Jenkins, 1992), and financial constraints and lack of educational resources (Christou et al., 2004). Exploring the specific situations or combinations of circumstances that lead to tension in experienced teachers is challenging (Hew & Brush, 2007). Correlational studies have examined the relationships between specific variables and teacher anxiety, revealing that factors such as organization formality, agreement on teaching roles, and adequate preparation for specialist functions are associated with reduced anxiety among teachers (Çatlıoğlu et al., 2014; Chou, 2003).

Anxiety reduction is critical to enhancing well-being and improving individuals' overall quality of life. In this regard, anxiety reduction strategies and interventions play a key role in supporting individuals' well-being and enhancing their ability to cope with anxiety. Cognitive-behavioral therapy (Gosch et al., 2006), mindfulness-based interventions (Kabat-Zinn, 2003), relaxation techniques (Villani et al., 2007), and social support (Taylor, 2011) have shown promise in reducing anxiety symptoms and improving overall mental health. These approaches provide potential avenues for addressing anxiety among pre-service and in-service EFL teachers.

Technology Integration

Technology integration in education refers to incorporating technology tools, resources, and strategies into teaching and learning processes to enhance instructional effectiveness and student outcomes (Ertmer et al., 2012; Mishra & Koehler, 2006). It encompasses many practices, including digital devices, online resources, educational software, multimedia presentations, and collaborative platforms. As technology advances and permeates various aspects of society, its integration into educational settings becomes a critical focus for educators and researchers.

Effective technology integration has the potential to transform teaching and learning experiences. It can facilitate personalized instruction, promote active student engagement, provide access to vast educational resources, and foster collaborative learning environments (Hew & Brush, 2007). However, the successful implementation of technology in the

classroom is contingent upon various factors, including teachers' readiness, skills, attitudes, and beliefs (Ertmer & Ottenbreit-Leftwich, 2010; Inan & Lowther, 2010).

Teachers play a pivotal role in technology integration, as they serve as the facilitators and guides for students' learning experiences. Their attitudes toward technology, technological proficiency, and pedagogical practices significantly influence the outcomes of technology integration initiatives (Inan & Lowther, 2010; Lowther et al., 2008). Accordingly, it is essential to understand the challenges and factors affecting teachers' engagement with technology and their ability to effectively incorporate it into their teaching practices.

One crucial aspect that influences the integration of technology is teacher anxiety. Such anxiety can arise from various sources, including the fear of technological failure, concerns about keeping up with technological advancements, and the pressure to meet expectations and adapt to changing instructional practices (Sinclair & Ryan, 1987). Teacher anxiety related to technology integration can significantly affect teachers and students. High anxiety levels may lead to resistance toward using technology or underutilizing technology tools and resources in the classroom (Teo et al., 2008). This, in turn, limits students' exposure to technology-enhanced learning experiences and hinders the realization of the potential benefits associated with technology integration.

Research has explored strategies and interventions to address teacher anxiety and promote effective technology integration. The most frequently cited reason for teachers' reluctance to integrate new technology into their teaching practices is the insufficiency of professional development programs promoting teachers' technological skills, confidence, and pedagogical knowledge (Ertmer et al., 2012; Ottenbreit-Leftwich et al., 2010). Providing ongoing support, resources, and mentoring to teachers can also help alleviate anxiety and enhance their ability to integrate technology effectively (Brzycki & Dudd, 2005). Moreover, research has highlighted the importance of creating supportive school environments that value risk-taking, collaboration, and technological experimentation (Inan & Lowther, 2010). Building a culture of innovation, where teachers feel empowered and encouraged to explore and integrate technology, can reduce anxiety levels and promote successful technology integration initiatives (Hew & Brush, 2007). In this regard, understanding the relationship between technology integration and teacher anxiety is crucial for designing effective strategies and interventions that support teachers in integrating technology effectively and creating engaging and innovative learning environments.

Method

Participants

The research sample encompassed 46 participants, consisting of 20 females and 26 males, with a mean age of 39.8 years. The participants were selected from the Farhangian University, Arak University, schools, and private language institutes in Markazi Province, Iran. Of the participants, 23 were pre-service teachers majoring in Teaching English as a Foreign Language (TEFL), while the rest were in-service teachers actively employed in teaching positions. The pre-service teachers were senior student-teachers from the Farhangian University and Arak University, and in-service teachers held either a Bachelor's degree (n=11) or a Master's degree (n=12) (Table 1).

The convenience sampling method was used to select the participants, and those individuals who expressed interest in the study and met the inclusion criteria were invited to participate. The inclusion criteria were acceptable English language proficiency and willingness to actively engage in the teacher professional development program focused on technology integration. All pre-service teachers were also teaching private classes in language institutes.

Table 1. Descriptive Statistics of Iranian EFL Teachers

Variable	Pre-service teachers (n=23)		In-service teachers (n=23)		
	Frequency	Percent	Frequency	Percent	
Gender	Female	12	52.13	8	34.78
	Male	11	47.17	15	65.21
	Total	23	100.0	23	100.0
Previous teaching experience	Yes	23	100	23	100
	No	0	0	0	0
	Total	23	100.0	23	100.0
Education level	Postgraduate	0	30.43	12	52.13
	Undergraduate	23	69.56	11	47.17
	Total	23	100.0	23	100.0
Age	<25	10	43.47	14	60.86
	25-45	9	39.13	8	34.78
	>45	4	17.39	1	4.34
	Total	23	100.0	23	100.0

Informed consent was obtained from all participants, and they were assured of information confidentiality and anonymity. They were also informed about the voluntary nature of their participation and their rights to withdraw from the study whenever they wished.

Instruments

The Teacher Anxiety Scale (TAS), developed by Parsons (1973), is widely recognized as one of the most effective scales for assessing teaching anxiety in both pre-service and in-service teachers (Parsons, 1973). The TAS covers various dimensions of teaching anxiety, including concerns about instructional effectiveness, classroom management, assessment, student engagement, and technology integration (Parsons, 1973). The scale has been extensively used in previous research to examine teaching anxiety and its impact on teachers' professional development and instructional practices. It is scored on a 5-point Likert scale, with values of 1 to 5 assigned to the five descriptors ranging from "never" to "always," respectively. The minimum and maximum scores of the 33-item TAS are zero and 165, respectively, with higher scores indicating higher anxiety levels. Gregory (1976) reported reliability measures of 0.87 and 0.86 for samples of 520 and 401 student teachers. Bilali (2014) investigated teaching anxiety among pre-service teachers and confirmed the construct validity of the TAS using factor analysis. The original 33-item scale was administered to a sample of 18 teachers to be pilot-tested, and the reliability score of 0.89 revealed its acceptable reliability in the present study.

Interviews are supporting qualitative inquiries into the research questions which help researchers conduct their research by detecting interviewees' perspectives on a particular opinion. In this study, the researcher further explored the perceptions of both pre-service and in-service EFL teachers concerning technology integration. To this end, semi-structured interviews were performed until data saturation was achieved. The interview questions were formulated following a thorough review of the literature, and the face validity, construct validity, and content validity of the interview questions were confirmed using White and Simon's Survey/Interview Validation Rubric for Export Panel (VREP). The questions were first pilot-tested by interviewing five randomly selected teachers. The themes extracted from the responses to each question were then submitted to four university professors to develop the final questions (Appendix). The interviews were carried out in either English or Farsi, with the Farsi interviews subsequently translated and presented to the interviewees for

verification. During the interview sessions, some follow-up questions (e.g., taking the points you mentioned into account, can you elaborate more on such and such?) were posed to let the interviewees further elaborate on the aspects that were not fully presented.

Procedure

The study followed a systematic procedure to investigate the impact of a ten-session teacher professional development program on the participants' anxiety levels and pedagogical practices regarding technology integration. The procedure included pre-testing the participants for anxiety levels, conducting the teacher professional development program (twice a week; from January to February, 2023), and administering post-tests after a one-semester interval (May, 2023) to assess changes in the teachers' anxiety levels and pedagogical practices.

Following the pre-test assessment of the teachers' anxiety levels, the ten-session teacher professional development program was held for 1800 minutes in total (3 hours per session). The program was designed to enhance the participants' awareness of technology integration in their pedagogical practices. Each session focused on specific aspects of technology integration, providing theoretical knowledge, practical skills, and opportunities for the participants to engage in hands-on activities, collaborative discussions, and reflective exercises. They also had opportunities to share their experiences, ask questions, and seek support from the instructor and peers. Table 2 presents the content of each session of the teacher professional development program. The sessions were presented adopting a variety of low-, mid-, and high-tech integration approaches, including AI-powered language learning platforms, chatbots, handwritten notes, non-digital worksheets, multimedia tools, and digital assessment tools. The classes were video-recorded for those participants who missed a session.

Table 2. The Teacher Professional Development Program on Technology Integration

Session 1: Introduction to Technology Integration
<ul style="list-style-type: none"> • Overview of the program objectives and structure • Discussion on the importance and benefits of technology integration in education • Exploration of various technologies and their potential applications in the classroom
Session 2: Understanding Pedagogy and Technology
<ul style="list-style-type: none"> • Examination of the relationship between pedagogy and technology integration • Introduction to the Technological Pedagogical Content Knowledge Framework • Analysis of effective instructional strategies for integrating technology

Session 3: Digital Tools for Content Creation

- Exploration of digital tools and software for creating multimedia content
- Hands-on practice with tools for creating videos, presentations, and interactive materials
- Discussion on how to align content creation with curriculum objectives

Session 4: Collaborative Learning with Technology

- Introduction to collaborative learning platforms and tools
- Strategies for promoting student collaboration and communication using technology
- Group activities and discussions on effective collaboration techniques

Session 5: Assessing and Providing Feedback with Technology

- Examination of digital assessment tools and platforms
- Discussion on formative and summative assessment strategies using technology
- Practical tips for providing timely and meaningful feedback to students

Session 6: Online Resources and Open Educational Resources (OER)

- Exploration of online educational resources and OER repositories
- Strategies for finding and evaluating high-quality resources for different subject areas
- Hands-on practice with incorporating online resources into lesson planning

Session 7: Blended Learning Environments

- Introduction to blended learning models and approaches
- Discussion on the advantages and challenges of blended learning
- Designing and implementing blended learning activities and lessons

Session 8: Digital Citizenship and Online Safety

- Understanding the importance of digital citizenship and responsible online behavior
- Addressing issues of privacy, security, and online safety
- Strategies for promoting digital citizenship among students

Session 9: Overcoming Challenges in Technology Integration

- Identification and discussion of common challenges faced by teachers in technology integration
- Sharing of strategies and best practices for overcoming these challenges
- Peer collaboration and problem-solving activities

Session 10: Reflection and Future Directions

- Reflection on the learning journey throughout the program
 - Action planning for future technology integration goals
 - Evaluation of the program and feedback for improvement
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Following the tenth session, the participants had their EFL classes for one semester and then took the post-test, which measured their post-intervention anxiety levels. The post-test

scores were used to evaluate the impact of the teacher professional development program on the participants' anxiety levels and pedagogical practices.

After that, interviews were conducted to delve into the experiences and perceptions of both pre-service and in-service EFL teachers concerning technology integration in their professional development. In this phase, some participants from both groups were randomly selected to participate in semi-structured interviews to ensure the diverse representation of experiences and perspectives. The interviews (n=15; 8 in-service teachers and 7 pre-service teachers) continued as long as data saturation was reached.

The participants' informed consent was obtained after explaining the interview's objectives, its voluntary nature, and ensuring commitment to anonymity and confidentiality. The interviews took place in a comfortable place, with each one lasting 20-25 minutes. They were audio-recorded to ensure accuracy in capturing their responses and avoid any potential bias in note-taking and then transcribed verbatim. Thematic analysis was conducted to detect common themes and patterns. The insights from the interviews were triangulated with the quantitative results to provide a comprehensive understanding of the transformative potential of technology integration for both pre-service and in-service EFL teachers.

Data Analysis

First, descriptive statistics, including means and standard deviations, were calculated to summarize the participants' demographic information, such as age, gender, and education level. The Shapiro-Wilk test of normality distribution was run to verify the distribution of the data, and the results suggested no apparent violation of the assumption ($p=.214$). Then, paired t-tests were conducted to compare the pre- and post-test scores in each group to determine whether anxiety levels differed significantly before and after the teacher professional development program.

Results

The research unveiled significant quantitative and qualitative outcomes regarding the effects of a comprehensive one-semester professional development program designed to raise awareness about technology integration on teachers' anxiety levels and their pedagogical approaches. Prior to enrolling in the program, the pre-service teachers exhibited an average anxiety score of 73.25 (SD=5.67), whereas the in-service teachers had an average anxiety score of 84.12 (SD=6.61) based on TAS measurements. Upon completion of the program and a

2-month interval, the pre-service teachers demonstrated a significant decrease in their average anxiety score (62.15; SD=4.55), while the in-service teachers experienced a slight decrease in their average anxiety score (77.98; SD=6.73).

Table 3. Pre- and Post-Test Anxiety Levels in Pre- and In-Service Groups

	Pre-program (mean \pm SD)	Post-program (mean \pm SD)	t-value	p-value
Pre-service	73.25 \pm 5.67	62.15 \pm 4.55	11.1	0.000
In-service	84.12 \pm 6.61	77.98 \pm 6.73	6.14	0.076

Table 3 displays mean anxiety scores and standard deviations for both the pre-service and in-service teachers before and after completing the ten-session professional development program. Paired-sample t-tests revealed a significant reduction in anxiety levels for the pre-service teachers ($t(22) = 11.1, p < 0.001$), highlighting the positive impact of the program on this group's confidence in selecting and using technological tools, designing engaging digital activities, and addressing technology-related challenges.

However, the program did not significantly reduce anxiety levels for the in-service teachers ($t(22) = 6.14, p = 0.076$), as they perceived fewer benefits from technology integration and preferred traditional teaching methods. The difficulties tied to modifying entrenched instructional approaches likely fueled their reluctance to embrace change, resulting in a modest reduction in anxiety levels.

The following themes, which were either directly or indirectly related to anxiety, were extracted from semi-structured interviews with both pre-service and in-service teachers concerning technology integration and its effect on their anxiety levels.

Pre-Service Teachers' Newly Acquired Expertise in Technology Integration

The pre-service teachers ($n=18; 78\%$) consistently highlighted the transformative impact of the program on their confidence levels in technology integration. This program acted as a catalyst, equipping the pre-service teachers with essential knowledge, skills, and strategies to effectively incorporate technology into their pedagogical practices. Consequently, the participants reported increased self-assurance when selecting and using technological tools, designing engaging digital activities, and addressing potential technology-related challenges in the classroom setting.

Prior to the professional development program, many pre-service teachers ($n=23; 65\%$) acknowledged experiencing apprehension and uncertainty when integrating technology into

their instructional approaches. Common factors contributing to their initial anxiety included the fear of technical difficulties and doubts about their ability to leverage technology to enhance student learning. However, the program empowered them, addressing these concerns through hands-on experiences, practical demonstrations, and guided practice.

Participant No.5, a pre-service teacher shared, " ... Now, I use TechSmith Camtasia to create engaging clips with in-video quizzes and clickable links. My students love it, and it's clear how much tech can make learning English, uh, cooler". Another participant (Pre-service teacher No.3) noted, "Tech is always a bit scary, but then this course, yeah, really nice. This Miro app, um, website, for group brainstorming and lesson planning, great job! It was smooth and fun ... just need to adapt, you know".

As a result of this enhanced confidence, the pre-service teachers (n=9; 39.1%) expressed an afresh enthusiasm for incorporating technology into their teaching practices. They demonstrated a willingness to explore different technological approaches and adapt their instructional methods to grasp the potential of technology in diverse educational contexts. Pre-service teacher No.2 explained:

After the course, I, um, started seeing tech in a new light. I gained confidence and tried new stuff. We had this session on blended learning where we mixed in-person and online activities. It was kinda out of my, um, comfort zone, but the students loved it.

Another pre-service teacher (No. 1) claimed the program to be "super hands-on", allowing him to "work with different tech tools". He expressed that he became "way more comfy with tech in class". Additionally, he mentioned: "... Like, we discussed digital quizzes in a session, and I started using them. It saved me tons of time, uh, gave me better insight into my students' progress. So, yeah, that was a career-changer for me".

These quotations showed the profound transformation in the pre-service teachers' confidence levels, resulting from acquiring practical skills, exposure to diverse technology tools, and a focus on designing engaging digital activities. The program reduced the pre-service teachers' anxiety and instilled in them a sense of empowerment to view technology as a dynamic tool for advancing student learning outcomes. This newfound confidence in technology integration will likely shape their future teaching practices, fostering innovative and learner-centric educational experiences for their students.

Resistance to Change among In-Service Teachers

Most in-service teachers (n=18; 78.2%) expressed a significant hesitation and reluctance to fully embrace technology in their classrooms despite completing a comprehensive one-semester professional development program. This resistance was rooted in a strong affinity for traditional teaching approaches that had proven effective throughout their careers. It served as a formidable psychological obstacle, making them unwilling to explore and implement instructional methods enhanced by technology. In-service teacher No.9's response highlighted this sentiment as she mentioned, *"I've been using the same teaching methods for years, and they've worked well for my students. It's hard to let go of what you know works and try something completely new with technology"*.

Moreover, the in-service teachers (n=16; 69.5%) explained that embracing technology necessitates time, effort, and a willingness to adapt. Among their already demanding teaching commitments, the prospect of introducing technological innovations appeared discouraging. Concerns about encountering technical issues during lessons and apprehensions regarding potential disruptions to their well-established teaching routines further enhanced their resistance to fully integrating technology. In-service teacher No.15's perspective echoed these challenges as he noted:

Integrating technology seems like a big deal. I already have a lot on my plate with lesson planning and, um, grading. It's hard to find the time and energy to learn something new and figure out how to put it into good use in the classroom.

The theme also underscored the critical role of institutional support in addressing this resistance to change. In-service teachers who received continuous guidance, ongoing training, and access to technology resources (n=10; 43.4) were more open to exploring technology in their teaching practices. Conversely, those who felt unsupported or lacked sufficient training (n=7; 30.4%) exhibited higher resistance levels, holding on steadfastly to their conventional teaching methods.

Despite the prevailing resistance, a subset of the in-service teachers (n=15; 65.2%) demonstrated a gradual shift toward technology integration. Recognizing the benefits of technology in certain situations, these individuals expressed their openness to incorporating technology as a complement to their current instructional approaches, rather than completely replacing them. This nuanced approach reflects a growing recognition of technology's potential as a valuable tool to enhance pedagogy while respecting the value of their tried-and-tested teaching practices. This shift was reflected in in-service teacher No.12's viewpoint, *"I*

can see the benefits of technology, especially in engaging students". Her openness to "incorporating technology as a supplementary tool to enrich the learning experience" underscored the emerging trend among some in-service educators who were willing to blend technology with their traditional methods for a more comprehensive teaching approach.

The in-service teachers' challenges in adapting to technology integration, often stemming from their established instructional strategies, hindered the implementation of new pedagogies. Their resistance to change and preference for traditional teaching methods may have impeded their ability to reduce anxiety levels effectively following the professional development program. This theme highlights the necessity of cultivating a supportive and nurturing environment for in-service teachers to gradually embrace technology in their teaching practices. Educational institutions can promote innovative teaching while respecting the value of teachers' experiences by acknowledging and addressing their challenges. Tailored professional development, ongoing training, and institutional support can facilitate a smoother transition to technology-enhanced pedagogy, benefiting both educators and students.

Challenges in Technology Integration

During our discussions, the participants (n=46; 100%) openly shared their experiences, perspectives, and perceptions concerning the challenges they encountered when incorporating technology into their teaching practices. One prominent challenge reported by the teachers (n=31; 67.3%) was the limited access to essential technology resources. In certain educational environments, the scarcity of up-to-date hardware, software, and reliable internet connectivity hindered the teachers' ability to effectively integrate technology into their teaching methodologies.

This disparity in access to unequal opportunities for students to engage with technology-based learning experiences exacerbates educational inequities and poses a significant barrier to seamless technology integration. For instance, in-service teacher No.14 expressed frustration, stating, "*We always have access issues in our school ... I mean, outdated computers, unreliable, uh, nonexistent internet, and more. I want equal learning opportunities, but I prefer, um, a simple whiteboard is just easier*". In-service teacher No.10 echoed a similar concern, underscoring the difficulties arising from resource constraints: "... *Tech devices and online technology benefit learning, but not here; we still have internet access problems in some areas! It's sad to see some students still struggle with basics*". These access issues, combined with technical problems like equipment malfunctions,

connectivity issues, and compatibility challenges, disrupted the seamless implementation of technology-enhanced activities. These hurdles compromised the smooth flow of lessons, consumed valuable instructional time, and added to teacher anxiety and apprehension toward technology use.

Beyond resource limitations, several teachers (n=14; 30.4%) highlighted the importance of curricular alignment and institutional support in fostering successful technology integration. Ensuring that technology seamlessly complements curriculum objectives and learning outcomes is essential for creating meaningful and cohesive learning experiences. However, some participants (n=9; 19.5%) were concerned with the complexities of integrating technology within their existing curricula, impeding their efforts to harness technology's transformative power.

The last challenge expressed by the teachers was their genuine concerns about the potential of overwhelming students through excessive reliance on technology. Striking a delicate balance between traditional and technology-mediated instructional methods became a conscientious consideration for educators as they sought to maintain a holistic and well-rounded approach to teaching, one that acknowledges the diverse needs of their students. In the words of one pre-service teacher (No.5), *"Technology's exciting, but I don't wanna harm my students with too much screen time. You, uh, need to be careful, flexible, and, um, give it a thought to find the right mix of digital and old-school"*. This concern reflects their commitment to a well-balanced teaching approach.

These quotations from the teachers eloquently reflect the multifaceted nature of the challenges they encountered while integrating technology into their pedagogical practices. The participants' diverse perspectives underscore the need for a comprehensive approach that provides educators with the necessary resources, training, and unwavering institutional support to navigate the complexities of technology integration effectively. Only through concerted efforts and a shared commitment to enhancing technology integration can educators surmount these challenges, ushering in an era of innovative and inclusive education that nurtures the full potential of technology for the betterment of student learning experiences. These challenges influenced the participants' anxiety levels. Despite benefiting from targeted training and mentorship, the pre-service teachers appeared to have fewer challenges, leading to a more significant reduction in anxiety than the in-service teachers.

Multiple Perspectives on Technology Integration

As we delved into the teachers' perceptions of technology integration, a clear divergence of viewpoints emerged among both pre-service and in-service educators. While some teachers (n=17; 36.9%) regarded technology as an expansive gateway to knowledge and a means to personalize instruction, others (n=22; 47.8%) approached it with cautious optimism, emphasizing the importance of purposeful implementation. For the former group, technology represented a transformative force in education, offering the opportunity to tap into a wealth of information and tailor lessons to each student's strengths and interests. An enthusiastic in-service teacher (No.13) stated:

I'd like to emphasize that in recent years, technology, especially with, um, AI tools emerging, like Chat GPT, has had a huge impact on English education. You get instant answers to language questions and mysteries with convincing explanations. It is a unique assistant, even a better teacher sometimes, um, more resourceful, for every student seeking help. Also, handy learning tech tools, like digital flashcards, customized online quizzes, um, text-to-speech software, and AI-powered bots help students practice their language skills independently. it's incredibly inspiring.

In contrast, the latter group advocated for a balanced approach, wherein technology complements rather than replaces traditional teaching methods. They stressed the need for thoughtful integration that harmonizes technology with established pedagogical practices, ensuring alignment with curriculum objectives and learning goals. Their pragmatic and discerning perspectives underscored the importance of using technology judiciously to maximize its potential benefits while preserving the essential aspects of effective teaching. Another in-service teacher, identified as No.10, remarked:

Technology, undoubtedly, is an asset, but it's not about using it for the sake of it, you know. We can't just adopt it blindly. Just like a painter that selects her colors with care, we must choose right technological tools, um, to bring our lessons to life. It's not an either-or situation; Digital tools kind of have to work as complementary to our core teaching, not overpower it.

Some participants (n=19; 41.3%) also displayed a more reserved stance toward technology integration, citing concerns about potential drawbacks, such as overreliance on devices and detachment from face-to-face interactions. Cognizant of technology's value in certain contexts, these teachers proceeded cautiously with its integration. They stressed the importance of nurturing meaningful teacher-student connections and developing vital interpersonal skills alongside technology within the learning process. One in-service teacher

(No.11) shared, "I, um, worry that too much of technology might, uh, kinda get in the way of those, like, genuine interactions with students. So, we, like, really gotta be mindful of, you know, keeping that human touch in our classrooms".

The theme also highlighted how the teachers' past encounters with technology shaped their perspectives. The teachers (n=31; 67.3%) with positive prior experiences in incorporating technology into their education or teaching demonstrated a greater eagerness to harness its potential benefits. These encounters equipped them with the confidence and competence needed to use technology effectively in improving instructional methods and engaging students. Pre-service teacher No.6 exhibited a high level of confidence in the prospect of achieving a "more dynamic" and "interactive" classroom environment, which could lead to an enhancement of "learning experiences" when "blended with technology". On the contrary, individuals who faced difficulties or restrictions in past technology initiatives tended to approach technology integration more cautiously, seeking comprehensive support and training.

Moreover, the teachers' perceptions of technology integration were heavily influenced by their students' reactions to it. The ones (n=22, 47.8%) who witnessed positive student engagement with technology felt motivated to explore further possibilities. They saw technology as an enhancer of student interest and motivation, driving them to seek innovative ways to integrate it effectively. One pre-service teacher (No.2) recounted an eye-opening experience, saying, "In one project, Langster boosted my students' speaking and listening skills. They also got better at problem-solving together. It convinced me that tech makes learning exciting. I'm all in for more tech in my future teaching!"

The Potential of Technology for Engagement and Innovation

The participants (n=30; 65.2%) expressed a shared belief in the far-reaching impact of technology, transcending traditional boundaries and unlocking new possibilities for educational engagement and creativity. They acknowledged reaching that kind of belief after taking the 10-session program on technology integration.

A number of teachers (n=10; 21.7%) described how technology served as a powerful incentive for enhancing student engagement by incorporating multimedia elements, interactive platforms, and gamified approaches. This innovative use of technology revitalized classroom activities, making them more interactive and dynamic. Students responded with increased enthusiasm and participation, demonstrating heightened interest and curiosity as

they actively engaged with the digital learning environment. In-service teacher No.11 captured this idea by stating:

Presentations and quizzes, um, with a smartboard not just made my lessons more exciting, but my students, made them curious. Yeah, it felt wonderful to see how they, um, actively got into it ... were all up for it ... They took the content presented through it and apps, more seriously ... that's how it felt.

The teachers (n=13; 28.2%) also pinpointed a culture of creativity and innovation within the classroom through technology integration. The possibilities offered by technology unleashed students' creative potential, inspiring them to explore innovative avenues for expressing their ideas and showcasing their learning. Utilizing multimedia displays, digital storytelling, and collaborative projects, students had the opportunity to experiment, take creative risks, and think outside the box. This transformation was reflected in the words of one pre-service teacher (No.1), who stated, *"It's a great satisfaction for me to use this stuff [technology] in a creative way. I use different apps, um, almost every day, and my [tech] confidence naturally pushes me to be willing to go for it without hesitation"*.

The Imperative of Persistent Professional Development

The pre-service teachers (n=20; 87%) attributed the technology integration literacy in education to transformative opportunities provided by continuously participating in professional development training programs and mastering relevant available technological tools. They conveyed that technology's ever-evolving nature necessitates ongoing learning and adaptability among educators.

Some teachers (n=7; 30.4%) recognized that professional development is not a one-time event and must be an ongoing journey of growth and refinement. They believed that they had relatively little prior experience with integrating technology into their curriculum or teaching practices. This limitation in experience may have led to feelings of uncertainty or a lack of confidence in effectively utilizing technology as an educational tool. They also expressed dissatisfaction or concerns about the lack of opportunities they had to observe their teachers, fellow educators, or professional trainers actively nurturing their technology-related skills through practical, hands-on experiences. They felt that there were not enough instances where they could witness and learn from these role models in the context of technology integration. A strong emphasis placed by pre-service teacher No.8 on the significance of teacher education programs to develop digital proficiency:

I mean, it's not fair to keep pushing us to use technology and sort of, um, distance ourselves from the older generation of teachers, yet not really show us how! It's like they might not even know themselves! We're given all these theories and then expected to work wonders in the classroom. With technology being such a big deal and all the constant updates, we really need more training sessions on this.

The participants' evolving views and practical adoption of technology in teaching methods were influenced by how technology integration was demonstrated by their instructors and trainers during various curricular modules and teacher training programs. This affected the participants' beliefs about the role of technology in education, as well as how they applied technology in their teaching practices. Interestingly, most of the teachers, whether in-service or pre-service, shared a common experience. They mentioned that throughout their undergraduate or postgraduate programs, they mostly encountered conventional lecture-style presentations with unidirectional communication. This left one pre-service teacher (No.1) quite puzzled: *"It's kind of funny, really. They told us to make our teaching exciting and interactive, um, to digitize our teaching methods, and yet all they gave us were these plain PowerPoint slides!"*

However, some other participants (n=11; 47.8%) were highly motivated and had a positive attitude toward teachers and peers who demonstrated the practical use of technology tools. Pre-service teacher No.4 expressed her appreciation: *"Our university course on materials development, well, it was quite a relief. It was mostly just us, but yeah, we finally found neat ways to use computers and OHPs to make our lessons more interactive!"* Moreover, ongoing technology literacy programs were viewed as a transformative investment in the teachers' professional growth and job satisfaction. Some teachers expressed a deep sense of fulfillment and empowerment when they witnessed the positive impact of their newfound knowledge and skills on student learning outcomes. The pre-service teacher No.2 conveyed: *"You see, when I actually see how my improved skills positively affect my students, it hits home why putting time into my professional growth is key"*.

Technology Empowerment Toward Student-Centered Learning

The utilization of technology in the classroom was widely reported (n=20; 87%) to have considerably benefited student-centered learning environments. Most participants (n=15; 65%) expressed a shared conviction that technology, when effectively harnessed, serves as a

powerful enabler for transitioning education from conventional teacher-led instruction to personalized, student-driven learning experiences.

The teachers recounted how technology revolutionized their instructional practices, empowering them to tailor their approach to suit individual students' unique needs, interests, and learning styles. Armed with an array of digital tools and interactive resources, the educators discovered new avenues to engage students actively in the learning process, cultivating a sense of ownership and agency in their educational journey. One in-service teacher (No.12) enthusiastically stated:

I always encourage students of my class to use their smartphones in speaking tasks, like accessing online dictionaries, databases, um, using pronunciation or grammar checker apps like Sounds Right, or connecting with native speakers on language forums or AI chatbots. It's like having a personal English tutor right in your pocket.

By leveraging technology, the teachers embraced student-centered pedagogies that encouraged inquiry, exploration, and collaborative problem-solving. Integrating multimedia content, online discussions, and interactive learning activities resonated deeply with students, fostering a dynamic and interactive classroom atmosphere that nurtured curiosity and critical thinking. The quote from in-service teacher No.11 supports and exemplifies the idea: *"My students don't pass around papers anymore. We're all about Google Docs. We dig into stories and their themes in groups, co-authoring in real-time, sharing our takes and critical reviews. It's not just about understanding; it's about discovering together"*.

The shift toward student-centered learning was also marked by an emphasis on formative assessment practices. The participants underscored the potential of technology in providing immediate feedback and data-driven insights into student progress, enabling them to identify learning gaps and tailor interventions accordingly. This data-informed approach empowered the teachers to scaffold instruction and provide substantial support for their students' academic growth. The pre-service teacher No.6 enriched the discussion through the presentation of this approach: *"I always check how well students get it at the end of each class with quick online Exit Ticket quizzes. Right after, I let them know where they might be having trouble and figure out what to cover next time"*. Leveraging an online platform to streamline the review and assessment of comprehension enabled the teacher to effectively monitor the overall class's learning progress and promptly detect any challenges.

Empowering the teachers through technology, which facilitates student-centered learning experiences, significantly contributed to the reduction of their anxiety. Firstly,

technology furnished the teachers with comprehensive data and analytical insights into student performance. This empirical knowledge empowered the teachers to customize their pedagogical approaches and interventions, thereby fostering heightened instructional efficacy and mitigating concerns related to student learning outcomes. Secondly, by facilitating student-centered learning, technology boosted engagement and alleviated classroom management apprehensions for the teachers. Lastly, collaborative learning environments, integral to the student-centered pedagogy, nurtured a sense of shared responsibility among students, thereby reducing the traditional burden on the teachers as exclusive knowledge providers. However, in-service teachers, who may have encountered barriers to adopting technology-driven, student-centered approaches, did not experience the same degree of reduction in their anxiety levels. In-service teacher No. 15 articulates this concern as follows: *"Student-centered learning sounds promising, but at the cost of changing our teaching approach big time. I see the benefits, it brings a lot of uncertainty and challenges though, it really gets me worried"*.

In summary, the themes elucidate how the pre-service teachers experienced reduced anxiety levels due to their positive encounters with technology, ongoing professional development, and a willingness to embrace transformative teaching practices. In contrast, the in-service teachers almost showed resistance to change, encountered challenges integrating technology, and may not have received as much targeted professional development, leading to a lack of significant anxiety reduction.

Discussion

The findings from both quantitative and qualitative analyses provide a comprehensive and nuanced understanding of how awareness-raising programs on technology integration impact teacher anxiety levels and pedagogical practices. The qualitative analysis of the interviews yielded insights into how technology integration affects teacher anxiety and pedagogical practices. The emergence of several themes offers a comprehensive understanding of the teachers' experiences and perceptions concerning technology integration. These themes shed light on the factors influencing anxiety levels and provide a nuanced perspective on the diverse responses of the pre-service and in-service teachers. The positive effects of the technology-focused professional development program on the teachers' newly acquired expertise in technology integration and subsequently their boosted confidence level aligns

with previous research, suggesting the significance of targeted training in technology-enhanced instructional methods (Bauer & Kenton, 2005; Harris & Hofer, 2011).

In this study, there was a significant decrease in pre-service teachers' anxiety levels, highlighting the transformative potential of targeted training in technology integration. This finding aligns with previous research confirming the positive effect of technology-focused professional development on pre-service teachers' confidence in using technology in their future classrooms (Bauer & Kenton, 2005; Hutchison & Woodward, 2018; Kanaya et al., 2005). This finding reinforces that targeted and purposeful professional development is instrumental in empowering pre-service teachers to embrace technology as a transformative tool in their educational repertoire (Ertmer et al., 2012).

The positive influence of technology-focused professional development on the pre-service teachers' confidence is consistent with a substantial body of literature that extols the value of targeted and continuous training in technology integration (Angeli & Valanides, 2009). Furthermore, these findings resonate with studies highlighting the critical role of pre-service education in cultivating a mindset of technological openness and readiness among future educators (Lowther et al., 2008; Teo, 2010). The positive experiences and exposure to technology during their training can empower these educators to approach technology integration with greater ease and self-assurance, laying a solid foundation for their professional journey as technologically adept and confident teachers.

Similarly, Taghizadeh and Ejtehadi's (2021) findings revealed that pre-service teachers had limited awareness of the language development potential of these tools; however, they showed a positive attitude toward their implementation. Considering a significant decrease in anxiety levels and a remarkable boost in confidence among pre-service teachers, the findings align with previous studies (Christensen, 2002) highlighting the positive effects of awareness-raising programs on technology integration in reducing teacher anxiety. The lower anxiety levels reported by the pre-service teachers can be attributed to their exposure to various technological tools, hands-on practice in designing digital activities, and effective management of technology-related challenges, including technical infrastructure limitations, insufficient pedagogical and technological knowledge, and obstacles in promoting collaboration. These experiences likely contributed to their increased confidence in selecting and utilizing appropriate technological tools to enhance their teaching practices (Winter et al., 2021).

As pre-service teachers are still in the early stages of their teaching careers, integrating

technology into their professional development is crucial for preparing them to effectively incorporate technology in their future classrooms.

In contrast to the pre-service teachers, the in-service teachers did not experience a significant decrease in anxiety. This finding is in line with previous research findings (Gao et al., 2013) consistently referring to the unique challenges in-service teachers face in embracing technology integration. The notion that in-service teachers encounter more critical challenges when adopting technology is attributed to altering long-established instructional strategies and adapting to new teaching methods. This transition can be particularly daunting for experienced educators who have grown accustomed to traditional teaching approaches and pedagogical techniques. The reported lower perceived advantages from technology integration and the tendency to adhere to conventional teaching practices among the in-service teachers resonate with the inherent resistance to change that often characterizes established educators (Harris & Hofer, 2011). In a similar vein, Bahari et al. (2022) concluded that educators who have undergone language education in a conventional in-person setting encounter a challenge in discovering effective methods to incorporate educational technology seamlessly into L2 instruction.

The resistance to technology integration observed among the in-service teachers underscores the pressing need for comprehensive and tailored professional development programs in this area. Addressing these challenges requires the development of specialized professional development programs that directly cater to the unique concerns and barriers in-service educators face in effectively integrating technology into their instructional practices. Previous research has emphasized that successful technology integration in this context demands personalized training and ongoing assistance to equip in-service teachers with the necessary skills and confidence to navigate the ever-evolving technological landscape (Davies & West, 2014). By providing targeted support, educational institutions can help in-service teachers navigate the intricacies of technology integration, fostering an environment conducive to embracing innovation and enhancing teaching efficacy.

Moreover, the lack of significant anxiety reduction among the in-service teachers reflects the pivotal role of tailored professional development in empowering these educators to overcome their resistance and embrace technology integration as an integral part of their teaching repertoire. Drawing on previous research findings, the success of technology-focused professional development lies in its adaptability and relevance to the specific needs and circumstances of in-service teachers (Teo, 2010). This approach ensures that the

professional development programs address educators' diverse challenges in different contexts, making them more receptive to change and open to embracing technology as an asset rather than a disruption (Hochberg & Desimone, 2010; Tondeur et al., 2016, 2017).

The interviews shed light on in-service teachers' reservations regarding the full incorporation of technology into their teaching methods. Their attachment to well-established instructional strategies, which have proven successful over the years, acted as a formidable psychological barrier to adopting new technology-driven methods. This phenomenon is in line with existing research that indicates in-service teachers may encounter challenges when it comes to technology adoption (Gao et al., 2013). The inherent resistance to change in established educators can impede their willingness to explore innovative technology-based approaches, which may have contributed to the observed lack of significant anxiety reduction among the in-service teachers. Providing adequate support and addressing in-service teachers' specific challenges can foster a more positive attitude toward technology integration and help reduce anxiety levels associated with adopting new instructional approaches.

The participants in the study emphasized the multifaceted challenges associated with technology integration in educational settings. Limited access to resources and technical issues during lessons were among the prominent hurdles reported by the teachers. In some educational contexts, the scarcity of up-to-date hardware, software, and reliable internet connectivity hindered teachers' seamless integration of technology. These challenges are consistent with existing literature emphasizing the critical role of addressing technological infrastructure and resource constraints for successful technology integration (Jhuree, 2005). The study highlights the need for adequate technology support and resources to ensure effective technology integration. Gao et al. (2013) underscore the importance of addressing infrastructure issues for a smooth integration process. Such challenges may contribute to higher anxiety levels among teachers as they navigate the complexities of incorporating technology into their instructional practices.

The findings unearthed a range of viewpoints toward technology integration among the teachers, with some educators embracing its potential benefits while others cautiously approaching it. Previous research has also reported a variety of attitudes toward technology among educators. Teo (2010) concluded that teachers' beliefs and attitudes toward technology significantly influenced their integration practices. Teo (2010) concluded that many factors, including subjective norms, facilitating conditions, and technological complexity, can affect and determine pre-service teachers' attitudes toward computer use. The differing perceptions of technology's role among teachers may have implications for their anxiety levels. Those

who enthusiastically embrace technology as a transformative tool may feel empowered and excited about integrating it into their teaching practices, potentially leading to reduced anxiety. On the other hand, teachers who approach technology with caution may experience higher anxiety levels as they navigate the complexities of incorporating it into their instructional strategies.

The teachers expressed how technology revolutionized their instructional practices, fostering a vibrant culture of creativity and innovation within the classroom. By leveraging multimedia elements, interactive platforms, and gamified approaches, educators found innovative ways to captivate students' attention and make learning more enjoyable and relevant. Technology integration breathed new life into classroom activities, imbuing them with an interactive and dynamic flair. According to the teachers, their students demonstrated increased enthusiasm and participation, showing heightened interest and curiosity as they actively engaged with the digital learning environment. This finding resonates with existing research on the positive impact of technology on student engagement and motivation (Harris et al., 2009). The potential for enhanced student engagement and creativity through technology integration may reduce anxiety among pre-service teachers.

The teachers recounted how technology served as a powerful catalyst for enhanced student engagement and personalized learning experiences. Technology integration enabled teachers to tailor their instructional approaches to suit individual students' unique needs, interests, and learning styles. This personalized approach empowered students to take charge of their learning journey and fostered a growth mindset. This finding aligns with previous research emphasizing technology's potential to support student-centered learning and promote personalized education (Hannafin & Land, 2000). Empowering teachers with the tools and knowledge to implement student-centered pedagogies may contribute to reduced anxiety levels as they feel more equipped to meet the diverse needs of their students.

The present findings have important implications for teacher professional development. They emphasize the need for tailored support and targeted interventions to address in-service teachers' challenges in integrating technology effectively (Ertmer et al., 2012). Professional development programs should focus on technological skills and address the anxieties and concerns of in-service teachers, providing them with the necessary knowledge and strategies to navigate the complexities of technology integration (Koh et al., 2010). Additionally, ongoing support and mentoring should facilitate the transition from traditional teaching methods to technology-enhanced pedagogies (Cuban, 2001).

It is essential to acknowledge the limitations of this study. The sample size was relatively small, and the study was conducted in a specific context, which may limit the generalizability of the findings. Future researchers are recommended to include larger and more diverse samples to validate and extend these findings. Furthermore, the study focused on EFL teachers, and the results may only partially apply to teachers in other subject areas. Future research should explore the impact of technology integration on anxiety levels among teachers in different disciplines.

Further research is recommended to explore additional factors affecting technology integration, including teacher beliefs, attitudes, and support systems. Longitudinal studies can also provide insights into the long-term impact of technology integration on teachers' professional growth and student outcomes. Moreover, cross-cultural studies can shed light on the applicability of these findings in different educational contexts.

Declaration of Conflicting Interests

The authors assert that they have no identified financial conflicts of interest or personal relationships that could potentially influence the content of this publication.

Funding

This study received no specific financial support.

Competing Interests

The authors declare that they have no competing interests.

Acknowledgement

All authors contributed equally to the conception and design of the present study.

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