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Pre-Service Teachers Strategies on Integrating ICT in EFL Classroom

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Abstract. Nowadays, Information and Communication Technology (ICT) has been emphasized in English as a Foreign Language (EFL) classroom. Despite the increasing emphasis on technology integration in language teaching, there remains a significant gap in understanding how pre-service teachers navigate this complex landscape. Using a qualitative research method, data for this study were collected through in-depth interviews with six pre-service English teachers enrolled in the Teacher Professional Education (*Pendidikan Profesi Guru*/PPG) Program in Indonesia. The findings revealed four major themes: teaching strategies (selection, development, and problem-solving), integration challenges (planning, technical, and student-related), affective challenges (confidence levels and personal challenges), and strategic solutions. The results indicate that while pre-service teachers face significant infrastructure and technical challenges; they demonstrated sophisticated approaches to technology integration, characterized by careful alignment with pedagogical objectives and adaptive problem-solving strategies. The study highlights the crucial role of teacher preparation programs in developing both technical competence and pedagogical confidence. These findings provide valuable insights for improving teacher education programs and professional development initiatives in technology integration for EFL contexts.
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INTRODUCTION

In recent years, the integration of Information and Communication Technology (ICT) has become increasingly essential in English as a Foreign Language (EFL) class. As digital technologies advance and influence educational environments, pre-service teachers encounter both possibilities and problems in properly integrating these resources into their teaching practices (Aisyiyah, 2022; Cahyono, 2024). The swift progress of technology-enhanced language learning has revolutionised conventional teaching

methods, necessitating pre-service teachers to acquire new skills and tactics for effective classroom application (Leba & Temaja, 2023).

Despite the recognized benefits of ICT integration in language teaching, many pre-service teachers encounter significant obstacles when attempting to integrate digital tools into their instructional practices. These challenges range from technical difficulties to pedagogical uncertainties (Putri & Syafryadin, 2022). As Meldia and Zakir (2022) note, the effective integration of ICT in EFL classrooms requires not only technological proficiency but also careful consideration of pedagogical approaches and learning outcomes. Furthermore, the shift towards technology-enhanced learning environments has been accelerated by recent global changes in education, making it essential for pre-service teachers to develop robust strategies for ICT implementation (Prastikawati, 2021)

A comprehensive review of the current literature uncovers multiple important research directions regarding the integration of ICT in EFL environments. Alkamel and Chouthaiwale (2018) conducted initial research that laid a foundation by exploring the essential uses of ICT tools in English language instruction, highlighting their capacity to improve student involvement and educational results. Budiman et al. (2018) expanded upon this fundamental research by presenting a more systematic framework via the SAMR model, specifically for the instruction of reading comprehension. Their findings emphasised the significant correlation between educators' views and their actual approaches to technology integration.

Recent research indicates a shift towards more sophisticated elements of technology integration. Fearnley and Amora (2020) examined the integration of Learning Management Systems in higher education, introducing an enhanced Technology Acceptance Model that includes both technological and psychological factors affecting the adoption of information and communication technology. This technological perspective was complemented by Islam et al.'s (2022) work on promoting student-centered blended learning, which emphasized the importance of balanced integration between traditional and digital teaching methods. Also, Hsiao et al. (2022) created a detailed observation protocol for blended STEM classes that gave teachers and students useful information about how to engage students and interact with each other in technology-rich settings.

The most recent studies have begun to focus on specific aspects of digital integration in language learning. Indrayani et al. (2024) explored the role of informal digital language learning, highlighting how learning frequency impacts overall language acquisition. In the same way, Cahyono (2024) gave an in-depth look at the technological tools used in Indonesian EFL classrooms, which taught us a lot about how to use these tools in different situations.

Regarding strategies to overcome ICT implementation barriers, Nurkhamidah (2020) found that GGD teachers employed several practical approaches. Teachers actively sought informal learning opportunities through peer collaboration, where they consulted with more technologically proficient colleagues for guidance and troubleshooting. Additionally, teachers demonstrated initiative by utilizing their personal devices and internet connections when school facilities were inadequate. To address time management challenges in preparing ICT-based materials, teachers allocated extra preparation time outside of school hours and developed a repository of digital teaching resources that could be reused and adapted for different classes.

Still, there is a big hole in our knowledge of the actual strategies that pre-service teachers come up with and use to deal with ICT integration problems. Although current research has identified numerous problems (Aisyiyah, 2022) and explored theoretical frameworks for technology adoption (Fearnley & Amora, 2020), there has been little focus on the solution-oriented strategies that pre-service teachers develop throughout their teaching practice. Most research have concentrated on in-service educators or

general ICT deployment, resulting in a significant gap in comprehending how pre-service teachers address and overcome ICT integration challenges during their critical transition from theoretical training to practical application.

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This study holds significant importance for several reasons. First, it addresses a critical need in teacher preparation programs by identifying both challenges and practical solutions specific to pre-service teachers' experiences with ICT integration. Second, the findings will contribute to developing more effective support systems and training modules for future teachers, potentially reducing the theory-practice gap in technology integration. Third, by focusing on pre-service teachers' strategies, this research will provide valuable insights for educational institutions in designing more targeted and effective ICT training programs. Finally, the results will help inform policy decisions regarding the integration of technology in teacher education programs and EFL instruction.

This study aims to bridge these gaps by investigating both the challenges that pre-service teachers face while integrating ICT in EFL classrooms and exploring effective strategies to overcome these obstacles. The findings will be particularly valuable for teacher educators, educational institutions, and future pre-service teachers who are preparing to integrate ICT into their EFL teaching practice, ultimately contributing to more effective and innovative language teaching methodologies.

Based on the explanation above, the research questions are formulated as follows:

1. What strategies do pre-service teachers adopt in teaching an integrating ICT in EFL classroom?
2. What challenges do pre-service teachers face while integrating ICT in EFL classroom?
3. What personal challenges do pre-service teachers face in teaching and integrating ICT in the EFL classroom?
4. What solution do pre-service teachers adopt to cope with the challenges in teaching and integrating ICT in EFL classroom?

METHOD

This study employs a qualitative research methodology that attempt to explore real-life, individual insight, multiple cases through a detailed and in-depth collection of data from multiple sources of information (Yin, 2018). Aligning with the objectives of the study, this method attempts to investigate Indonesian EFL pre-service teachers' strategies, challenges and solution on integrating ICT in classroom. Interviews will be conducted with six pre-service English teachers who are currently enrolled in the Teacher Professional Education (*Pendidikan Profesi Guru*/PPG) Program

1. Data Collection

The researcher employed an interview to get data on the challenges and methods of pre-service teachers. An interview serves as a method in qualitative research to obtain

comprehensive information on diverse subjects. This research aims to gather precise information from participants regarding the obstacles they encounter and the strategies they employ. The research questions for this study formed the foundation for the enquiries posed during the interview for this research. Throughout the interview, the researcher provided additional spontaneous questions to follow up on or elucidate the participants' responses to the main issues. When utilising open-ended enquiries, the researcher can ask more profound enquiries related to the responses provided, while simultaneously remaining compliant with the initially posed questions. The interviews ranged from fifteen to thirty minutes in duration for each participant.

2. Data Analysis Procedure

The iterative process most accurately characterises the essence of the total data analysis technique. Prior to initiating the analysis of the collected data, it is essential to establish the criteria that will guide the data analysis process. This step is essential to facilitate the orderly execution of the data analysis process. In the process of qualitative research, it is crucial to establish norms that should be followed diligently. This practice helps to mitigate biassed interpretations and avoid hasty generalisations. Additionally, it involves coding, identifying clusters of codes that occur at least twice, and transforming each cluster into a coherent theme. Furthermore, this enables the avoidance of overly broad generalisations. After transcribing the interviews, an iterative process was implemented, involving several readings of the verbatim transcripts. This process aimed to facilitate the introduction, coding, grouping, retrieval, and reorganisation of the data, as well as to explore relationships between codes in order to develop themes and ultimately address the research questions. Although the subject of the study remained a focal point throughout the process, the interviews were read and reread to identify any additional potential themes that may have emerged. Conversely, since the research questions formed the basis for the semi-structured interview questions, it was challenging to identify any distinct themes.

RESULTS AND DISCUSSION

The analysis of interview data revealed for major themes regarding pre-service teachers' experiences with ICT integration in EFL classroom: teaching strategies, integration challenges, affective challenges, and solution. Each theme comprises several sub-themes that provide insights into how pre-service teachers navigate the complex landscape of technology integration in language teaching.

Pre-service Teacher Strategies in ICT Integration

Pre-service teachers demonstrated three primary strategic approaches to ICT integration: selection, development, and problem-solving strategies. The selection strategy findings align with Meldia and Zakir's (2022) assertion that effective ICT integration requires careful consideration of pedagogical approaches and learning outcomes. As participant M3 noted,

"Before choosing, selecting the technology, we must ensure the media that will be used is align with the objective of the study."

This strategic alignment between technology and learning objectives reflects a mature understanding of pedagogical principles, supporting Budiman et al.'s (2018) framework for systematic technology integration.

The development strategy findings revealed an encouraging trend of self-directed learning among pre-service teachers. Participant M1's observation that

"The more I use technology, the more I familiar with, and technology integration in class help me and students to be more active"

demonstrates the iterative nature of technology adoption. This finding resonates with Islam et al.'s (2022) research on promoting student-centered blended learning, suggesting that pre-service teachers are actively working to create more dynamic and interactive learning environments.

In terms of problem-solving strategies, participants showed remarkable adaptability, particularly in addressing infrastructure limitations. The use of personal devices and alternative teaching materials, as exemplified by M1 and M2's

".. for me I prepare a backup plan. Because the school does not have a stable connection of internet nor the facility, so I must print out the material."

backup planning approaches, mirrors Nurkhamidah's (2020) findings regarding teachers' practical solutions to technological constraints. This adaptability suggests that pre-service teachers are developing crucial resilience skills necessary for technology integration in resource-limited contexts.

Integration Challenges Faced by Pre-service Teacher

The challenges identified in ICT integration can be categorized into planning, technical, and student-related issues. Planning challenges, particularly in addressing diverse student needs and technological accessibility, align with recent findings by Putri and Syafryadin (2022). The difficulty in aligning technology with student needs, as expressed by M3's concern about understanding student backgrounds

"It is difficult because we have to know the background of each student, the class atmosphere, and how they receive the materials."

F2's emphasis on accessibility prediction, highlights the complex nature of technology integration in diverse classroom settings.

"Aligning technology is more about putting. I mean, we must predict for the students. Do this materials or do this platforms is accessible to students, or is it interactive for students."

Infrastructure limitations emerged as a persistent barrier, confirming Aisyiyah's (2022) findings regarding technological readiness in Indonesian educational contexts. F3's observation about inadequate internet connectivity

"Facilities and infrastructure that did not support the internet connection."

M1's experience with non-functional school facilities suggest that despite technological advancement

"The school does not have stable connection, also the facilities. Most of the facilities that school provide does not work when I teach there."

Basic infrastructure issues continue to impede effective ICT integration. This finding indicates a need for systemic support at the institutional level, as suggested by Leba and Temaja (2023).

Student-related challenges, particularly regarding technology misuse and varying levels of digital literacy, present unique obstacles for pre-service teachers. M2's concern about supervising student technology use,

“Most of the time is the misuse of technology, we as a teacher still supervise students one by one, so it is still a problem to me.”

F1's observation about varying student capabilities

“Not all students can work with technology.”

Align with Indrayani et al.'s (2024) findings on the impact of digital literacy on language learning outcomes. These challenges underscore the need for differentiated instruction strategies in technology-enhanced learning environments.

Affective Challenges Faced by Pre-service Teacher

There are three challenges that pre-service teachers frequently mention in technology integration; Confidence level, personal challenges, training impact in. in the confidence level, the analysis revealed varying levels of confidence among pre-service teachers. This variation was influenced by two main factors: how familiar they were with technology and their awareness of system limitations. For example, M1 showed high confidence (rating himself 5 out of 5) because they were very familiar with technology, while F1 was more cautious (rating herself at 60%) due to her awareness of infrastructure limitations and SDGS analysis of Indonesia’s technological readiness.

Personal challenges centered around maintaining student-centered learning environments while integrating technology, echoing Fearnley and Amora's (2020) findings on technology acceptance in educational settings. F2's concern about maintaining student-centeredness

“How to integrate technology but still student-centred. Because student-centred is difficult.”

M2's struggle with technological evolution highlight the ongoing tension between pedagogical principles and technological innovation.

The impact of training emerged as a crucial factor in shaping pre-service teachers' approaches to technology integration. The findings revealed that participant viewed their previous training as highly impactful on their current teaching practices, as demonstrated by M3’s,

”It is a big impact for me, especially in my bachelor year, there is one lecturer whose every lesson integrates technology. She inspire me so much back then.”

M3's reflection on the inspirational role of their bachelor's program lecturer demonstrates the lasting influence of effective modelling in teacher education, supporting Prastikawati's (2021) findings on the importance of technology-based training in teacher preparation programs. F3’s acknowledgment of how their training encouraged technology integration in the classroom. This dual influence of technical training and mentorship particularly important because it suggests that effective teacher preparation programs need to address both the practical skills of using technology and the psychological aspects of technology integration.

Solution and Adaptation by Pre-service Teacher

The finding revealed a systematic approach to technology integration that emphasizes understanding learning objectives before tool selection, as evidenced by M2's focus on lesson outcomes,

“We have to understand the lesson outcomes and the learning objectives first before choosing and selecting the technology that we will use.”

M3’s focus on connecting technology use with desired student outcomes and assessment. This approach aligns with Budiman et al.'s (2018) SAMR model implementation, suggesting that pre-service teachers are developing sophisticated frameworks for technology integration decisions.

The balanced approach to traditional and technology-enhanced teaching methods, as demonstrated by M1's strategic use of teacher-centred approaches for difficult content,

“Traditional teaching is usually teacher-centred, so I balance it when the materials is difficult for students.”

F1's integration of whiteboard use, reflects Islam et al.'s (2022) recommendations for effective blended learning environments. This finding suggests that pre-service teachers are developing nuanced understanding of when and how to leverage different pedagogical approaches.

Technical problem management strategies, including F2's emphasis on maintaining calm and having backup materials, and M2's use of engagement activities during technical difficulties, demonstrate the development of practical resilience strategies. These approaches align with Cahyono's (2024) recent findings on effective technological tool usage in Indonesian EFL contexts.

CONCLUSION

This study investigated the strategies, challenges, and solutions adopted by pre-service teachers in integrating ICT in EFL classrooms. The findings reveal a complex interplay between technological innovation, pedagogical practices, and contextual constraints that shape pre-service teachers' approaches to technology integration. Through detailed analysis of participant interviews, several significant conclusions emerge.

Pre-service teachers demonstrate sophisticated strategic approaches to ICT integration, characterized by careful selection of technological tools, continuous self-development, and adaptive problem-solving. Their emphasis on aligning technology with learning objectives and student needs indicates a growing maturity in pedagogical decision-making. This finding suggests that contemporary teacher preparation programs are succeeding in developing technologically mindful educators who prioritize pedagogical effectiveness over mere technological adoption.

While infrastructure and technical challenges persist, particularly in terms of internet connectivity and equipment functionality, pre-service teachers show remarkable resilience in developing workaround solutions. Their ability to create and implement backup plans, utilize personal resources, and maintain instructional continuity despite technical difficulties demonstrates the development of crucial practical skills necessary for effective technology integration in resource-limited contexts.

The varying levels of confidence and personal challenges reported by participants highlight the importance of addressing both technical and psychological aspects of technology integration in teacher preparation programs. The significant impact of prior training and mentorship on participants' current practices emphasizes the crucial role of modelling effective technology integration during teacher education.

The successful balance achieved between traditional and technology-enhanced teaching methods suggests that pre-service teachers are developing nuanced understanding of blended learning approaches. Their ability to strategically alternate

between different pedagogical methods based on content difficulty and student needs indicates a sophisticated grasp of educational technology's role in supporting, rather than replacing, effective teaching practices.

Future research could explore the long-term effectiveness of the strategies identified in this study and investigate how pre-service teachers' approaches to technology integration evolve as they transition into full-time teaching roles. Additionally, comparative studies across different educational contexts could provide valuable insights into how institutional and cultural factors influence ICT integration strategies.

In conclusion, while pre-service teachers face significant challenges in integrating ICT in EFL classrooms, their strategic approaches and solutions demonstrate promising developments in technology-enhanced language teaching. Their experiences highlight the importance of balanced, pedagogically-sound technology integration and suggest positive directions for the future of EFL instruction. The findings of this study contribute to our understanding of how to better prepare and support pre-service teachers in their journey toward effective technology integration in language teaching.

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