



Exploring the Integration of Technology in English Language Teaching: A Research Study

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ABSTRACT

Exploring the Integration of Technology in English Language Teaching: A Research Study, investigates the multifaceted relationship between technology and English language instruction. This mixed-methods study delves into English language teachers' attitudes, practices, challenges, and aspirations regarding technology integration. A combination of quantitative surveys and qualitative interviews, the study examines the perceptions and experiences of educators at varying levels of technology integration proficiency. Quantitative analyses reveal mean scores and frequencies across dimensions such as technology's role, integration challenges, perceived benefits, and impact on student engagement and learning outcomes. Qualitative provides depth and context, elucidating individual experiences, strategies, and visions for the future. Convergence and divergence between quantitative data and qualitative narratives offer nuanced understandings of technology integration in language education. The participants are 112 secondary school teachers from Kota Tangerang, Indonesia, selected randomly to ensure a diverse sample representing different levels of technology integration. Findings indicate a generally positive attitude towards technology integration among participants, tempered by challenges such as technical proficiency, resource accessibility, and pedagogical alignment. Despite obstacles, the teachers express a collective vision for technology's transformative potential in language teaching, advocating for innovation, equity, and student-centered learning. The study contributes to the ongoing discourse on technology integration in language education, offering insights for policymakers, practitioners, and researchers striving to harness the benefits of technology for enhanced language learning experiences.

Keywords: Technology integration; English language teaching, student engagement, learning outcomes

ABSTRAK

Menjelajahi integrasi teknologi dalam pengajaran bahasa Inggris adalah studi penelitian yang menyelidiki hubungan multifaset antara teknologi dan pengajaran bahasa Inggris. Studi metode campuran ini menggali sikap, praktik, tantangan, dan aspirasi guru bahasa Inggris mengenai integrasi teknologi. Dengan menggabungkan survei kuantitatif dan wawancara kualitatif, studi ini menguji persepsi dan pengalaman pendidik di berbagai tingkat kemahiran integrasi teknologi. Analisis kuantitatif mengungkap skor rata-rata dan frekuensi lintas dimensi seperti peran teknologi, tantangan integrasi, manfaat yang dirasakan, dan dampak terhadap keterlibatan siswa dan hasil pembelajaran. Kualitatif memberikan kedalaman dan konteks, menjelaskan pengalaman individu, strategi, dan visi untuk masa depan. Konvergensi dan divergensi antara data kuantitatif dan narasi kualitatif menawarkan pemahaman yang berbeda tentang integrasi teknologi dalam pendidikan bahasa. Temuan menunjukkan secara umum sikap positif terhadap integrasi teknologi di kalangan peserta, diimbangi oleh tantangan seperti kemahiran teknis, aksesibilitas sumber daya, dan keselarasan pedagogi. Meskipun ada kendala, para guru mengungkapkan visi kolektif mengenai potensi transformatif teknologi dalam pengajaran bahasa, menganjurkan inovasi, kesetaraan, dan pembelajaran yang berpusat pada siswa. Studi ini berkontribusi pada wacana yang sedang berlangsung mengenai integrasi teknologi dalam pendidikan bahasa, menawarkan wawasan bagi



para pembuat kebijakan, praktisi, dan peneliti yang berupaya memanfaatkan manfaat teknologi untuk meningkatkan pengalaman pembelajaran bahasa.

Kata Kunci: *Integrasi teknologi; Pengajaran bahasa Inggris, keterlibatan siswa, hasil belajar*

INTRODUCTION

In the evolving landscape of English Language Teaching (ELT), technology integration is reshaping language learning experiences (Muslimin et al., 2023; Zhai & Wibowo, 2023). However, there is still much to understand about its implementation, particularly regarding teachers' perceptions, teaching strategies, and its effect on student engagement and learning outcomes (Al-Habsi et al., 2022). The integration of the Technological Pedagogical Content Knowledge (TPACK) framework with the Community of Practice (CoP) theory emphasizes collaborative learning and innovative practice among teachers. The TPACK framework, which combines technology, pedagogy, and content knowledge, provides a comprehensive approach for educators to effectively integrate technology into their teaching (Koehler et al., 2010; Nagao, 2018). By utilizing this framework, teachers can develop a nuanced understanding of how technology can be seamlessly integrated into their instructional practices, enhancing both teaching and learning processes (Nagao, 2018). This collaborative approach not only aids in professional development but also ensures that the integration of technology is grounded in practical, real-world classroom experiences.

In this study, the TPACK framework will be applied to assess teachers' knowledge and capabilities in integrating technology with their pedagogical practices. The CoP theory will be used to facilitate the formation of collaborative networks among teachers, enabling them to support one another in their technology integration efforts. By combining these frameworks, the study aims to explore how collaborative professional development and shared expertise can enhance the effective use of technology in English language teaching (Yatun et al., 2021). Through this approach, the study contributes to the ongoing discourse on technology integration in ELT, offering insights for educators and policymakers aiming to harness the benefits of technology for enhanced language learning.

The relevance of these frameworks to the study lies in their potential to create a supportive and innovative teaching environment. By leveraging collective TPACK and the collaborative nature of CoPs, the study seeks to design transformative learning experiences



that not only improve teaching practices but also positively impact student engagement and learning outcomes

Previous studies have provided significant insights into technology integration in ELT, focusing on various aspects of the field. For example, Rintaningrum (2023) explored technology integration in Indonesia, offering insights into regional and policy implications but did not deeply examine educators' perceptions and teaching strategies. Al-Habsi et al. (2020) studied Community of Practice dynamics in Oman but did not fully address educators' strategies for technology integration. Bui (2022) gave an overview of technology integration practices among English teachers but lacked a specialized focus on ELT. Liang's (2021) research in mainland China provided insights into university teachers' perceptions but was limited in generalizability due to its geographical focus.

This study aims to fill these gaps by comprehensively examining educators' perceptions, teaching strategies, and student engagement in technology integration within ELT. Utilizing a mixed-methods approach that includes surveys, interviews, and classroom observations, this research seeks to provide a detailed understanding of technology integration practices specific to ELT (Fiel'ardh et al., 2023). The findings are expected to contribute significantly to the literature, offering valuable insights for policymakers and educators globally, ultimately enhancing technology-enhanced language learning experiences and empowering students in the digital age.

In addition to exploring the current state of technology integration, this study will specifically address the professional development needs and opportunities for ELT teachers. Effective technology integration requires targeted professional development that not only enhances teachers' technical skills but also their pedagogical strategies. This study will identify the specific areas where ELT teachers require support, such as:

1. Technical Proficiency

Providing training on how to use various technological tools and platforms effectively in the classroom.

2. Pedagogical Strategies

Developing innovative teaching methods that incorporate technology to enhance student engagement and learning outcomes.

3. Collaborative Learning



Creating opportunities for teachers to collaborate and share best practices within their professional communities.

4. Resource Accessibility

Ensuring teachers have access to the necessary technological resources and support systems.

5. Continuous Professional Development

Offering ongoing professional development opportunities to keep teachers updated with the latest technological advancements and pedagogical approaches.

By addressing these professional development needs, the study aims to equip ELT teachers with the necessary skills and knowledge to effectively integrate technology into their teaching practices. In turn this study will contribute to creating a more engaging and effective learning environment for students, fostering their linguistic proficiency and digital literacy.

Research Objective:

1. To investigate English language teachers' perceptions of technology integration in the classroom.
2. To explore the extent to which technology is currently integrated into English language teaching practices.
3. To identify the benefits and challenges of integrating technology in English language teaching.
4. To examine the pedagogical strategies English language teachers, use to integrate technology effectively into their teaching practices.
5. To assess the impact of technology integration on student engagement and learning outcomes in English language classrooms.

Research Questions:

1. What are English language teachers' attitudes toward using technology in the classroom?
2. How frequently do English language teachers incorporate technology into their teaching practices?
3. What are the perceived benefits of technology integration in English language teaching, and how do they vary across different contexts?
4. What pedagogical strategies do English language teachers use to integrate technology effectively into their teaching practices?



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5. How does the integration of technology impact student engagement and learning outcomes in English language classrooms?

LITERATURE REVIEW

Understanding the current landscape of technology integration in English Language Teaching (ELT) involves recognizing the rapid advances in digital tools and their growing role in language education. Historically, technology integration has evolved significantly, from early computer-assisted language learning (CALL) programs to modern blended learning and online courses (Dwivedi et al., 2023; Kamalov et al., 2023).

Historical Context and Existing Gaps

Previous studies have extensively covered areas such as Generative AI in higher education and the role of digital technologies in general education (Haleem et al., 2022; Yusuf et al., 2024). However, there remains a gap in understanding the specific context of technology integration within ELT. This research aims to fill these gaps by examining multicultural perspectives and providing an in-depth analysis of technology integration practices specific to ELT. Our mixed-methods approach seeks to uncover insights into teachers' perceptions, pedagogical strategies, and student engagement, ultimately enhancing technology-enhanced language learning experiences and empowering students.

Technological Pedagogical Content Knowledge (TPACK)

The TPACK framework, developed by Mishra and Koehler (2006), provides a comprehensive model for understanding the interplay between technology, pedagogy, and content knowledge in educational contexts (Koehler et al., 2016). TPACK emphasizes the importance of teachers having integrated knowledge to effectively use technology to support and enhance teaching within specific content areas (Ning et al., 2022). This integration allows teachers to design meaningful learning experiences that leverage technology while aligning with curriculum goals and student needs (Santos & Castro, 2021).

Community of Practice (CoP)

The concept of Community of Practice, introduced by Wenger (1998), refers to groups of individuals who share a common interest and engage in collaborative learning within a particular domain (Wenger & Trayner, 2015). CoPs provide platforms for educators to exchange ideas, share resources, and support each other's professional growth (Bouchamma et

al., 2017). These communities enable educators to collaborate on innovative pedagogical approaches, troubleshoot challenges, and collectively advance their practice.

Integrating TPACK and CoP Frameworks

The research framework integrates the TPACK model and the CoP concept to provide a robust foundation for exploring technology integration in ELT. This integrated approach facilitates a deeper understanding of how educators can leverage technology in their teaching practices and how collaborative learning within CoPs can support this process.

Figure 1 illustrates this integrated research framework, highlighting the synergy between TPACK and CoP in fostering effective technology integration in ELT.

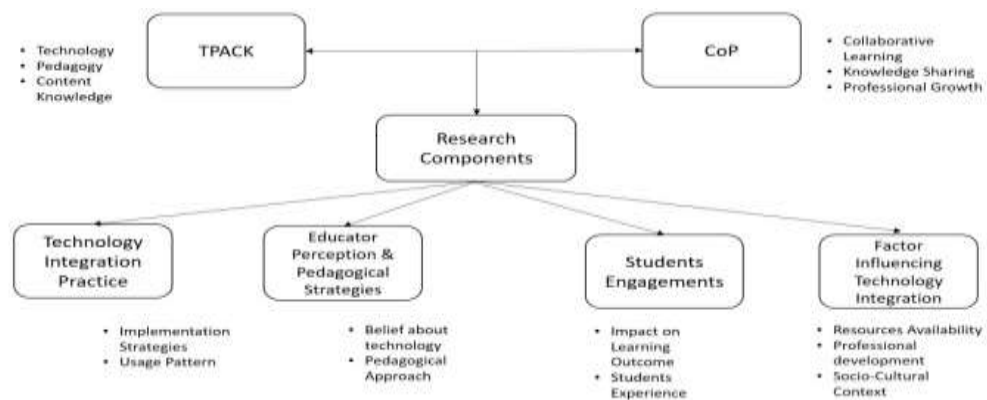


Figure 1. Integration of Technology in English Language Teaching Adoption from (Al-Habsi et al., 2022)

METHODS

Research Design

This study utilizes a mixed-methods approach to thoroughly examine technology integration in English language teaching (ELT). Quantitative methods are used to identify broad trends and correlations, while qualitative methods explore participants' experiences and perceptions, providing a comprehensive view of ELT pedagogy (Creswell, J. W.; Creswell, 2017; McLeod, 2023). By integrating these methods, the study captures the complex nature of technology integration practices and offers detailed insights into ELT.

Development and Validation of Instruments

Quantitative Instruments

The quantitative aspect of the study employs a structured survey instrument developed specifically for this research. The survey consists of multiple sections, each designed to



measure different dimensions of technology integration, such as teachers' attitudes, perceived benefits, challenges, and the impact on student engagement and learning outcomes.

Development

The survey items were initially drafted based on an extensive literature review and existing validated instruments in the field of educational technology and ELT. Input from subject matter experts was sought to ensure the relevance and comprehensiveness of the items.

Validation

Content Validity

A panel of experts in ELT and educational technology reviewed the survey items to assess their relevance and clarity. Revisions were made based on their feedback.

Construct Validity

Factor analysis was conducted on a pilot sample to verify the underlying structure of the survey and to ensure that the items grouped into coherent factors representing the intended constructs.

Reliability

The survey's internal consistency was assessed using Cronbach's alpha, with values above 0.70 considered acceptable, ensuring that the items within each construct were reliably measuring the same underlying concept.

Qualitative Instruments

The qualitative component involves semi-structured interviews and classroom observations to gather in-depth insights into teachers' experiences and perceptions of technology integration.

Development

The interview guide was developed based on themes identified in the literature review and insights from the quantitative survey. The guide included open-ended questions designed to elicit detailed responses about teachers' experiences, challenges, and strategies related to technology integration.

Validation

Content Validity

The interview questions were reviewed by a panel of experts to ensure they were comprehensive and aligned with the study's objectives.



Reliability

Consistency in data collection was maintained by training the interviewers and using the same interview protocol across all participants. Triangulation was employed by comparing the interview data with classroom observations and quantitative findings to enhance the reliability and validity of the qualitative data.

Data Collection

The study's participants included 112 secondary school teachers from Kota Tangerang, Indonesia, selected randomly to ensure a diverse sample representing different levels of technology integration. This approach allows for a thorough understanding of technology integration across various teaching contexts (Rafi et al., 2019).

The demographic profiles of participants feature a balanced mix of male and female teachers aged 27-65, with a range of teaching experiences from novice to veteran educators. The study examines the relationship between these demographic factors and the extent of technology integration in ELT.

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Data Analysis Procedures

In this study, quantitative and qualitative methods were employed to analyze the data, ensuring a comprehensive understanding of technology integration in English language teaching (ELT).

For the quantitative data, descriptive statistics were used to summarize the basic features of the data, providing an overview of participants' attitudes, perceived benefits, challenges, and the impact of technology integration on student engagement and learning outcomes. Measures such as mean, median, mode, standard deviation, and frequency distributions were calculated (Cooksey, 2020).

The conclusions about the population based on sample data, various inferential statistical techniques were employed. Pearson correlation coefficients were computed to examine the relationships between demographic variables, such as age, gender, and years of teaching experience, and levels of technology integration (Aldowah et al., 2017). Multiple regression analyses were conducted to predict the extent of technology integration based on



these demographic factors and attitudes towards technology. Additionally, one-way ANOVA tests were performed to compare mean differences in technology integration levels across different demographic groups (Huang et al., 2021).

The qualitative data from interviews and classroom observations were analyzed using thematic analysis. This approach involved several steps to ensure a thorough examination of participants' experiences and perceptions. Initially, the data were transcribed, and transcripts were read multiple times to gain familiarity with the content (Xu & Zammit, 2020). Significant statements and phrases related to technology integration were highlighted through initial coding. These codes were then grouped into broader themes that captured key aspects of participants' experiences and perceptions (Naeem et al., 2023). The themes were reviewed and refined to ensure they accurately represented the data, with sub-themes developed to capture more specific aspects.

To enhance the credibility and validity of the findings, triangulation was employed. This involved comparing and contrasting data from interviews, classroom observations, and quantitative surveys to identify convergences and divergences. This process provided a comprehensive understanding of technology integration practices, ensuring a robust and nuanced analysis.

By utilizing these rigorous data analysis techniques, this study aims to provide detailed insights into the integration of technology in ELT. The findings contribute valuable knowledge to the field, offering a rich, detailed account of teachers' experiences and perceptions and informing future practice and policy.

Table 1. Demographics Profiles

Gender	F	%
Male	63	56.25
Female	49	43.75
Year of Teaching		
1-7	19	16.96
8-14	23	20.53
15-22	28	25.0
23-29	27	24.11
30>	15	13.39
Age		
26-32	15	13.39
33-40	30	27.08
41-48	32	28.57

49-56	25	22.32
57>	10	9.28

Results

This section presents descriptive statistics summarizing key demographic characteristics and variables of interest among the participants, providing a comprehensive overview and highlighting trends observed in the data.

Table 2. Overview of Data Characteristics

	Mean	Mode	Std. Dev.	Frequency	Percentage	α
English Language Teachers' Attitudes Toward Using Technology in the Classroom						
The Role of Technology Influences Willingness Share and Concern Technology in the Classroom	3.83	4.00	0.929	53	47.3%	0.745
Integrate Technology in the Classroom	4.00	4.00	0.920	47	42.0%	0.744
	3.99	4.00	0.915	48	42.9%	0.761
	3.91	4.00	0.916	50	44.6%	0.74
Frequency of Technology Incorporation into Teaching Practices						
Specific Technology Tools in the Classroom	4.05	4.00	0.919	44	39.3%	0.755
Challenge and Barrier in Technology Believe Technology in the Classroom	3.82	4.00	0.872	58	51.8%	0.727
	3.86	4.00	0.858	57	50.9%	0.6
Perceived Benefits of Technology Integration in English Language Teaching (Across Different Contexts)						
Technology Supports Language Learning	3.97	4.00	0.934	49	43.8%	0.766
Impact of Technology in Learning	4.06	4.00	0.913	45	40.2%	0.759

Instruction in Integrating Technology	3.95	4.00	0.905	47	41.9%	0.760
English Language Teachers' Attitudes Toward Using Technology in the Classroom						
Instruction Using Technology	3.95	4.00	0.938	46	41.1	0.758
Technology Enhances Student Learning	3.86	4.00	0.879	53	47.3	0.737
Confident Using Technology in Teaching	3.95	4.00	0.956	49.	43.8	0.704
Exploring Teachers' Perceptions and Practices in Technology Integration						
Understand the Role of Technology in Increasing Student Engagement and Learning	3.79	4.00	0.861	57	50.0	0.768
Teachers' Strategies to Integrate Technology into Their Teaching Practices	3.88	4.00	0.861	54	48.2	0.702
Teachers Believe Integrating Technology Influences Student Engagement and Learning Outcomes	3.69	4.00	0.806	61	54.5	0.734
Impact of Technology Integration on Student Engagement and Learning Outcomes						
Increase in Student Engagement	3.58	4.00	0.779	68	60.7	0.758
Positive Influence in Language Learning Interactions	3.64	4.00	0.781	70	62.5	0.729
Leading to Language Proficiency	3.72	4.00	0.951	59	52.7	709

Interpretation of Table 2: Overview of Data Characteristics



The table provides a summary of English language teachers' perspectives on incorporating technology into their classrooms. Descriptive statistics offer insights into various dimensions such as attitudes, usage frequency, perceived advantages, and the impact on student engagement and learning outcomes.

The findings suggest a substantial integration of technology in teaching practices, particularly regarding the use of specific technological tools. Teachers recognize the potential benefits of technology for enhancing language learning, reflected in mean scores ranging from 3.83 to 3.99. There is a notable enthusiasm for incorporating technology into educational practices, as evidenced by mean scores consistently around 4.00. However, this enthusiasm is tempered by awareness of the challenges and concerns related to technology use, with mean scores near 4.00 for these aspects.

In terms of the frequency of technology use, the data shows a significant level of integration, especially with specific tools. Teachers report a mean score of 4.05, indicating frequent utilization of technological resources. Despite this, the challenges and barriers to integration are evident, with a mean score of 3.82, highlighting the difficulties teachers face in fully embedding technology into their practices.

When examining the perceived benefits of technology integration in various teaching contexts, teachers recognize its potential to support language learning and improve instructional methods. Mean scores from 3.97 to 4.06 reflect a strong belief in the positive effects of technology on learning outcomes. Teachers also stressed the need for effective instructional strategies to integrate technology successfully, with mean scores around 3.95.

Further analysis of teachers' perceptions and practices in technology integration shows an understanding of technology's role in enhancing student engagement and learning (Pettersson, 2018). Teachers use various strategies to incorporate technology effectively (Akram et al., 2022). They see the benefits of technology for interactive language learning and proficiency development but also recognize the need to improve student engagement and further learning outcomes.

The descriptive statistics offer valuable insights into teachers' attitudes, practices, and the perceived benefits of technology integration in English language teaching (Alieto et al., 2024). They highlight teachers' enthusiasm and willingness to use technology in their classrooms (Alimyar & Lakshmi G, 2021), alongside the challenges and opportunities for improving the effective use of technology in language learning.

Assessing the reliability and validity of the measurement model is crucial to ensure the robustness and accuracy of these findings.

Table 3. Reliability and Validity Assessment of Measurement Model

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Attitudes in Integrating Technology	0.840	0.844	0.905	0.761
Benefit of Integrating Technology	0.875	0.894	0.924	0.802
Impact of technology integration on student engagement	0.816	0.820	0.891	0.732
Pedagogical Strategies for Technology Integration	0.852	0.869	0.911	0.775
Teachers' Perceptions and Practices in Technology Integration	0.800	0.803	0.882	0.714
Teachers' attitudes using technology in the classroom	0.916	0.918	0.935	0.705
Technology in Teaching Practice	0.940	0.950	0.962	0.893

Interpret Reliability and Validity Assessment of Measurement Model

The reliability of the constructs, as indicated by Cronbach's Alpha, rho_A, and composite reliability, demonstrates strong internal consistency across all dimensions. The values range from 0.800 to 0.940, surpassing the commonly accepted threshold of 0.700, suggesting that the items within each construct reliably measure the intended concept. Moreover, the Average Variance Extracted (AVE) values, ranging from 0.705 to 0.893, indicate satisfactory convergent validity. These values exceed the recommended threshold of 0.500, suggesting that the variance captured by the items is greater than the variance due to measurement error. Thus, the constructs effectively

measure the underlying concepts they intend to represent (Sailer et al., 2021). The reliability and validity assessment indicates that the measurement model successfully captures the constructs of attitudes in integrating technology, the benefit of integrating technology, the impact of technology integration on student engagement, pedagogical strategies for technology integration, teachers' perceptions and practices in technology integration, teachers' attitudes using technology in the classroom, and technology into teaching practice, providing a robust foundation for subsequent analyses and interpretations (Seufert et al., 2021).

Following the thorough assessment of reliability and validity in the measurement model, the analysis progresses to the evaluating of the structural model and testing hypotheses.

Table 4. Assessment of Reliability and Validity of the Structural Model and Testing Hypothesis

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Attitudes in Integrating Technology → Impact of technology integration on student engagement	0.059	0.045	0.094	0.632	0.002
Benefit of Integrating Technology → Impact of technology integration on student engagement	-0.025	-0.021	0.101	0.246	0.013
Pedagogical Strategies for Technology Integration → Impact of technology integration on student engagement	0.131	0.126	0.076	1.726	0.017
Teachers' Perceptions and Practices in Technology Integration → Impact of technology integration on student engagement	0.140	0.144	0.049	2.854	0.004
Teachers' attitudes using technology in the classroom → Impact of technology integration on student engagement	0.855	0.854	0.164	5.211	0.000
Technology into Teaching Practice → Impact of technology integration on student engagement	-0.178	-0.164	0.069	2.563	0.011

Interpretation Assessing the structural model and testing the hypothesis

The results represent the path coefficients from the structural model, indicating the strength and direction of the relationships between the latent variables in this model. Attitudes in Integrating Technology → Impact of technology integration on student engagement: The path coefficient is 0.059. This positive coefficient suggests that as attitudes toward integrating technology increase, the perceived impact of technology integration on student engagement

also tends to increase. The coefficient is statistically significant with a p-value of 0.002, indicating a strong confidence level in this relationship.

Benefits of Integrating Technology → Impact of technology integration on student engagement: The path coefficient is -0.025. This negative coefficient suggests that as the perceived benefits of integrating technology increase, the perceived impact on student engagement decreases slightly. However, the coefficient is not statistically significant at conventional levels (p-value = 0.013), indicating that this relationship may not be robust.

Pedagogical Strategies for Technology Integration → Impact of Technology Integration on Student Engagement: The path coefficient is 0.131. This positive coefficient suggests that as pedagogical strategies for technology integration increase, the perceived impact on student engagement also increases. The coefficient is statistically significant, with a p-value of 0.017, indicating a reliable relationship.

Teachers' Perceptions and Practices in Technology Integration → Impact of Technology Integration on Student Engagement: The path coefficient is 0.140. This positive coefficient suggests that as teachers' perceptions and practices in technology integration improve, the perceived impact on student engagement also tends to increase. The coefficient is statistically significant with a p-value of 0.004, indicating a strong confidence level in this relationship.

Teachers' Attitudes Using Technology in the Classroom → Impact of Technology Integration on Student Engagement: The path coefficient is 0.855. This highly positive coefficient suggests a strong relationship between teachers' attitudes toward using Technology in the Classroom and the perceived impact on student engagement. The coefficient is highly statistically significant (p-value = 0.000), indicating a robust and influential relationship.

Technology into Teaching Practice → Impact of technology integration on student engagement: The path coefficient is -0.178. This negative coefficient suggests that the perceived impact on student engagement decreases as technology integration into teaching practices increases. The coefficient is statistically significant, with a p-value of 0.011, indicating a reliable relationship.

After evaluating the structural model and testing the hypotheses, the next step involves assessing discriminant validity through the Fornell-Larcker criterion analysis. This analysis will provide insights into the distinctiveness of the constructs in the model, ensuring the validity of the measurement mode.

Table 5. Assessment Discriminant Validity through the Fornell-Larcker Criterion Analysis

Fornell Larcker	Attitudes in Integrating Technology	Benefit of Integrating Technology	Impact of technology integration on student engagement	Pedagogical Strategies for Technology Integration	Teachers' Perceptions and Practices in Technology	Teacher's attitudes using technology in the classroom	Technology into Teaching Practice
Attitude in Integrate Technology	0.872						
Benefit of Integrating Technology	0.892	0.896					
Impact of technology integration on student engagement	0.844	0.887	0.855				
Pedagogical Strategies for Technology Integration	0.806	0.891	0.879	0.880			
Teachers' Perceptions and Practices in Technology	0.766	0.735	0.833	0.678	0.845		



gy Integratio n Teachers' attitudes using technolog y in the classroo m Technolo gy into Teaching Practice	0.878	0.926	0.967	0.883	0.825	0.839	
	0.881	0.853	0.759	0.718	0.717	0.832	0.94 5

Interpret the Fornell-Larcker criterion using the provided correlation matrix

In examining the "Attitudes in Integrating Technology construct," the square root of its Average Variance Extracted (AVE) is 0.872, indicating that it explains 87.2% of the variance in its items. The correlations with other constructs, such as "Benefit of Integrating Technology" (0.892), "Impact of technology integration on student engagement" (0.844), and others, suggest that the construct shares less variance with these constructs than with itself, supporting discriminant validity.

Similarly, for the construct "Benefit of Integrating Technology," its square root of AVE is 0.896, indicating a high level of explained variance by its items. The correlations with other constructs are lower than the square root of AVE, further indicating discriminant validity.

For the construct "Impact of technology integration on student engagement," the square root of AVE is 0.855, indicating a strong internal consistency. Correlations with other constructs are lower than their AVE, supporting its distinctiveness. This pattern continues for each construct, confirming that each construct has stronger correlations with its items than with items from other constructs, thus meeting the criteria for discriminant validity.

Table 6. Descriptive Statistics Two-ways ANOVA based on Work Experience and Age and Gender

Variable	Dimension	Work Experience*Age*Gender	Mean Square	F	Sig. (2-Tailed)
Attitudes Toward Using Technology in the Classroom	The role of technology in enhancing language learning.	Work Experience*Age*Gender	1.733	2.327	0.020
	Factors influence your use of technology in teaching	Work Experience*Age*Gender	3.558	6.139	0.000
	Concerns about using technology in class	Work Experience*Age*Gender	3.433	5.923	0.000
Technology Usage Frequency in Teaching	The frequency to use technology in teaching	Work Experience*Age*Gender	2.616	4.048	0.000
	Kinds of technology tools used the most	Work Experience*Age*Gender	4.494	7.074	0.000
	Hinder challenges regular use of technology in teaching	Work Experience*Age*Gender	2.111	3.578	0.001
Benefits of Technology Integration in English Language Teaching	Technology benefit English language teaching across various contexts	Work Experience*Age*Gender	2.045	3.568	0.001
	Technology supports language learning for	Work Experience*Age*Gender	2.422	3.397	0.001

	diverse student backgrounds				
	I can provide examples of technology's impact on students' learning in the classroom	Work Experience*Age*Gender	3.636	5.431	0.000
	I can integrate technology into teaching	Work Experience*Age*Gender	2.209	2.997	0.003
Pedagogical Strategies for Technology Integration	I can align technology with my lesson objectives and enhance learning	Work Experience*Age*Gender	1.713	2.592	0.001
	I can share collaborative tech activities to engage students in language learning	Work Experience*Age*Gender	3.629	4.874	0.000
	Technology can impact student's engagement in English classes.	Work Experience*Age*Gender	3.234	4.549	0.000
Technology Impact on Student Engagement and Learning Outcomes	I can see the changes in student outcomes due to tech integration	Work Experience*Age*Gender	2.662	4.345	0.000
	Tech can affect language proficiency	Work Experience*Age*Gender	3.618	4.307	0.000

	and learning experience				
	Technology influences student engagement in language learning activities	Work Experience*Age*Gender	1.731	2.592	0.001
Technology's Influence on Language Learning Outcomes	I believe the impact of technology on learning outcomes and language proficiency	Work Experience*Age*Gender	3.629	4.874	0.000
	Technology contributes to the interactive and engaging English language learning environment	Work Experience*Age*Gender	3.234	4.549	0.000

Interpretation Two-ways ANOVA based on Work Experience and Age and Gender

Table 6 displays the results of a two-way ANOVA analysis, examining the interaction effects of work experience, age, and gender on various dimensions related to technology integration in English language teaching. The table provides the mean square, F-statistic, and associated significance level (p-value) for the interaction effect of work experience, age, and gender for each variable and dimension.

For "Factors influencing the use of technology in teaching," the mean square is 3.558, the F-statistic is 6.139, and the p-value is 0.000, indicating a significant interaction effect.

Similarly, "Concerns about using technology in class" shows a significant interaction effect with a mean square of 3.433, an F-statistic of 5.923, and a p-value of 0.000.

"Technology Usage Frequency in Teaching" exhibits significant interaction effects, with a mean square of 2.616, an F-statistic of 4.048, and a p-value of 0.000.

"Kinds of technological tools used the most" displays significant interaction effects, with a mean square of 4.494, an F-statistic of 7.074, and a p-value of 0.000.

"Hinder challenges regular use of technology in teaching" also shows a significant interaction effect, with a mean square of 2.111, an F-statistic of 3.578, and a p-value of 0.001.

Other dimensions such as "Benefits of Technology Integration," "Pedagogical Strategies for Technology Integration," "Technology Impact on Student Engagement and Learning Outcomes," and "Technology's Influence on Language Learning Outcomes" demonstrate significant interaction effects with varying mean squares, F-statistics, and p-values.

These results highlight the importance of considering the combined influence of work experience, age, and gender when examining attitudes, behaviors, and outcomes related to technology integration in English language teaching (Vázquez-Cano et al., 2023)(Koç et al., 2021; Vázquez-Cano et al., 2023).

Having completed the two-way ANOVA analysis to explore the effects of work experience, age, and gender on various dimensions related to technology integration and its impact on English language teaching, the next step is to conduct a regression analysis. Regression analysis will further elucidate the relationships between our independent and dependent variables, allowing for a deeper understanding of how different factors contribute to the outcomes observed in this research.

Table 7. Descriptive Statistics Regression Linear Integration of Technology in English Language Teaching

R	R Square	Adjusted R Square	F-Change	Sig. F Change
0.999	0.998	0.998	2731.153	0.000

Interpretation Regression Linear Integration of Technology in English Language Teaching

Table 7 displays the descriptive statistics for a linear regression analysis on the integration of technology in English language teaching. The table shows the coefficient of determination (R), which indicates how well the independent variables predict the dependent variable. R is close to 1, suggesting a strong relationship between the independent and dependent variables. The R Square value, also known as the coefficient of determination, represents the proportion of the variance in the dependent variable that is predictable from the independent variables. In this case, the R Square value is 0.998, indicating that the

independent variables can explain 99.8% of the variance in the dependent variable. Adjusted R Square adjusts the R Square value for the number of predictors in the model. The F-Change statistic tests the overall significance of adding the independent variables to the model. The F-Change value of 2731.153 is associated with a very low p-value (0.000), suggesting that the model is statistically significant. Overall, these results indicate that the model provides an excellent fit to the data and is highly predictive of technology integration in English language teaching.

While the regression analysis provides valuable insights into the statistical relationships between variables, a complementary qualitative approach can offer a deeper understanding by exploring the nuances of educators' perceptions, experiences, and strategies in integrating technology within the English language teaching context.

Interviews with six participants, divided into two with a low level of technology integration, two with a moderate level, and two with a high level of technology integration in teaching language in the classroom, yielded insightful findings.

1. Participants described instances of technology integration in their teaching practices

- A participant with limited integration expressed challenges and occasional experimentation with tools like online forums and educational apps.*
- Another participant, with moderate integration, discussed successes with tools like video conferencing platforms but faced challenges with advanced technologies.*
- A participant with high integration highlighted the successful use of an online vocabulary quiz platform to enhance student engagement.*

2. Challenges encountered and strategies employed

- Participants with low integration struggled to navigate digital tools and technical issues but sought professional development and colleague support.*
- Those with moderate integration faced difficulties selecting suitable technologies and adapting materials but focused on mastering key technologies and seeking guidance.*
- Participants with high integration focused on ensuring technology enhances learning, adapting to students' capabilities, and developing contingency plans.*

3. Assessment of technology integration effectiveness

- Participants evaluated student engagement and learning outcomes differently based on their integration level, considering factors like tool complexity and alignment with pedagogical objectives.*



4. Reflections on the overall experience and desired improvements

- Participants expressed a mix of successes and challenges, with varying levels of proficiency and support needs, and anticipated improvements in technology accessibility and simplicity.

5. Envisioning the future of technology integration

- Participants envisioned technology transforming language education, advocating for digital inclusion and innovation within their educational communities.

These interviews gained insights into English language teachers' diverse experiences, challenges, and aspirations regarding technology integration in their teaching practices. The qualitative responses offer valuable insights into teachers' challenges and successes in integrating technology into their teaching practices. However, further examination through quantitative analysis allows for a comprehensive comparison of attitudes and experiences toward technology usage in the classroom (Ammade et al., 2018; Rintaningrum, 2023).

1. Narrative Emergence

The intersection of quantitative data and qualitative responses offers a narrative that illuminates teachers' experiences and attitudes. Mean scores shed light on various facets of technology integration, indicating an overall positive disposition. However, qualitative narratives enrich this understanding by providing glimpses into real-life challenges and successes.

2. Challenges and Strategies

Participants' experiences align with varying levels of technology integration, as reflected in both quantitative data and qualitative responses. Challenges include navigating digital tools and addressing technical issues, with strategies ranging from seeking professional development to prioritizing pedagogical objectives.

3. Assessment of Effectiveness

While mean scores suggest positive perceptions of technology's benefits, qualitative insights highlight challenges in assessing its effectiveness. Strategies for optimizing technology integration include focusing on pedagogical objectives and involving students in decision-making.

4. Reflections and Desired Improvements

Quantitative data on teachers' attitudes toward technology aligns with qualitative reflections on their experiences and desired improvements. Challenges with technology



proficiency and resource accessibility are echoed in qualitative responses, emphasizing the need for tailored support and user-friendly technology options.

5. *Future Visions*

Teachers' visions for the future of technology integration align with quantitative perceptions, emphasizing innovation and digital inclusion. While mean scores indicate positive attitudes, qualitative insights underscore educators' roles as advocates for transformative change in language education.

6. *Complementary Perspectives*

Hypothetical qualitative insights complement quantitative findings on the impact of technology integration on student engagement and learning outcomes. While quantitative data provides numerical measures, qualitative narratives offer a narrative context, enriching the understanding of technology's impact.

By aligning quantitative measures with qualitative insights, a comprehensive understanding of technology integration in English language teaching emerges, highlighting its benefits and challenges. This synthesis enhances the credibility and depth of the research findings, offering valuable insights for educators and policymakers alike.

The comparison findings reveal the interplay between quantitative measures and qualitative insights, warranting further examination to discern the extent of convergence or divergence between the two data sources. Analyzing themes and patterns from both data sets allows us to identify convergence or divergence between quantitative and qualitative findings.

Integration Success and Challenges

Convergence

Both data sources indicate a mix of successes and challenges in technology integration. While quantitative data provides overall attitudes and frequencies, qualitative data offers rich narratives about specific instances and challenges teachers face.

Divergence

There may be some discrepancy in the level of optimism or pessimism expressed in qualitative responses compared to mean scores. For instance, participants with low technology integration may express more challenges than reflected in the mean scores.



Effectiveness Assessment

Convergence

Both data sources highlight challenges in assessing the effectiveness of technology integration. Participants across all levels need assistance evaluating the impact on student engagement and learning outcomes.

Divergence

Quantitative data may offer numerical measures of effectiveness, while qualitative responses provide nuanced insights into the criteria and indicators teachers consider. Perceived effectiveness may vary based on individual experiences and contexts.

Future Vision and Role

Convergence

Both data sources suggest a shared vision of technology transforming language education. Participants express aspirations for innovation and advocacy in technology integration.

Divergence

Levels of optimism and envisioned roles in shaping the future may vary. While quantitative data provides aggregated perceptions, qualitative responses offer diverse perspectives and personal motivations.

By examining these aspects, we can identify areas of convergence where both data sources align in insights and interpretations and areas of divergence where discrepancies or different perspectives emerge. This comparative analysis comprehensively explains teachers' attitudes, experiences, and visions regarding technology integration in language education.

DISCUSSION

This study explored English language teachers' attitudes toward technology integration through both quantitative analysis and qualitative exploration (Bui, 2022; Laksani, 2019). This dual approach revealed a nuanced understanding of the complexities surrounding technology integration in language education.

Convergence between Quantitative and Qualitative Findings

Our analysis revealed convergence between quantitative trends and qualitative responses. Both methodologies highlighted the crucial role of technology in enhancing language learning (Pilcher & Cortazzi, 2023). Mean scores depicted optimism, with teachers



believing in technology's transformative potential (Damsa et al., 2021). This sentiment echoed in qualitative narratives, where teachers envisioned technology revolutionizing language education, enabling personalized and immersive learning experiences.

Additionally, challenges encountered in the integration process resonated across both data realms. Quantitative measures outlined obstacles, while qualitative insights contextualized these barriers (Peters & Fàbregues, 2023). From navigating complex tools to addressing equity issues, teachers grappled with diverse challenges (Solé et al., 2020). However, amidst these struggles, a shared commitment to growth and innovation emerged. Teachers across all levels of technology integration displayed resolve to overcome obstacles, utilizing professional development opportunities and collaborative networks to navigate the evolving terrain of educational technology.

Divergence between Quantitative and Qualitative Findings

Despite convergence, divergence emerged, revealing complexities in technological integration. While quantitative measures reflected optimism regarding technology's impact on student engagement and learning outcomes, qualitative narratives provided a more tempered perspective (Goh & Yang, 2021). Participants with lower levels of technology integration expressed reservations and uncertainty regarding technology's effectiveness in enhancing student learning (Akram et al., 2022). This incongruence underscores the importance of perceptions in uncovering the underlying realities shaping teachers' experiences and attitudes toward technology integration.

Implications and Recommendations

Our study, navigating the convergence and divergence of quantitative and qualitative findings, provides a roadmap for action and reflection on technology integration in language education. The synthesis of insights highlights the need for tailored support and resources to empower educators to integrate technology effectively. Stakeholders can foster innovation and continuous improvement by investing in targeted professional development and cultivating collaborative learning communities. Additionally, addressing the gap between technology integration's perceived and actual impacts underscores the importance of ongoing research and evaluation. Longitudinal studies and mixed-methods approach offer avenues to uncover complexities, illuminate dynamics, and inform evidence-based strategies and policies.



CONCLUSION

This study bridges the gap between quantitative and qualitative methodologies to unveil the complex landscape of technology integration in language education. By exploring both convergence and divergence between these approaches, stakeholders can engage in reflection, dialogue, and action, shaping a future where technology fosters transformative learning experiences in the language classroom.

The main insights from this research highlight that English language teachers generally hold a positive attitude towards technology integration. Quantitative analysis revealed that teachers believe in the transformative potential of technology, with high mean scores reflecting optimism about its role in enhancing student engagement and learning outcomes. However, this optimism is tempered by significant challenges such as technical proficiency, resource accessibility, and pedagogical alignment. Teachers reported difficulties in navigating complex tools and ensuring equitable access to technology, which were recurrent themes in both quantitative and qualitative data.

Despite these challenges, a strong trend of commitment to growth and innovation emerged. Teachers across all levels of technology integration proficiency expressed a willingness to overcome obstacles through professional development opportunities and collaborative networks. This collective vision for technology's transformative potential was particularly evident in qualitative narratives, where teachers shared their strategies and aspirations for creating personalized and immersive learning experiences.

Another key pattern observed was the divergence in perspectives based on the level of technology integration proficiency. While participants with higher proficiency levels expressed confidence and enthusiasm about technology's impact on student learning, those with lower proficiency levels showed reservations and uncertainties. This incongruence underscores the importance of tailored support and resources to address the varying needs of educators in technology integration.

Ultimately, this research underscores the power of inquiry to drive transformation in language education. By blending quantitative insights with qualitative narratives, we illuminated the multifaceted nature of technology integration. Our findings emphasize the need for ongoing research and evaluation, as well as targeted professional development, to harness the benefits of technology for enhanced language learning experiences. Technology



emerges as a catalyst for transformative learning experiences, paving the way for every student to pursue linguistic proficiency and cultural fluency in the future.

No conflict of Interest Declared

I would like to declare that this research is free of conflict of Interest. The findings, interpretations, and conclusions presented in this study are solely based on the data collected and analyzed, and no external factors or competing interests have influenced the outcomes.

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JUPE2, Volume 2 (2), 2023, Page 373-403

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