ISSN E: 2709-8273
ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL

EFL TEACHERS' COGNITION ON TECHNOLOGY INTEGRATION IN ENGLISH LANGUAGE TEACHING AT THE UNIVERSITY LEVEL IN PAKISTAN

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Abstract
This study examines university-level EFL teachers' cognition concerning technology integration in English language teaching (ELT) in Pakistan. It investigates how teachers' beliefs, knowledge, attitudes, and contextual factors influence their instructional decisions regarding educational technology. Grounded in the Technological Pedagogical Content Knowledge (TPACK) framework, the study employs qualitative data from semi-structured interviews with EFL faculty members. The findings reveal a complex interplay between institutional constraints, teacher beliefs, and digital competence. The study highlights both the potential and challenges of technology adoption in Pakistani higher education and proposes recommendations for professional development and policy support.

Keywords: Technology Integration, EFL Teachers, Teacher Cognition, Higher Education, Pakistan Context

1. Introduction
In recent times, the integration of technology in English language classroom has become a necessity, increasing globalization in higher education. In English (EFL) classroom, technology proffers opportunities to enhance language learners' engagement by providing access to diverse linguistic resources. However, the fact remains that the extent and manner of technology adoption in classrooms are significantly shaped by EFL teachers' cognition. Cognition is defined as EFL teachers' beliefs, knowledge, attitudes, and prior experiences.
English language serves as a medium of instruction (EMI) in many higher education institutions in Pakistan, facilitating in teaching and learning and building a conducive environment. While universities are striving for digital transformation by taking practical steps, the success of such measures to a large extent depends on EFL teachers' willingness and ability to integrate technology meaningfully in classroom. EFL teachers faces many challenges, such as required infrastructural limitations, insufficient training on the use of technology, and lack of administration's support, shaping their cognition regarding technology use.
Given the scenario, this study attempts to explore the cognition of Pakistani university EFL teachers about the use and integration of technology in ELT classrooms. By examining their views, perceptions, motivations, and experiences, the current research aims to find out EFL teachers views about the integration of technology and potential challenges they face during classroom teaching.

2. Literature Review
2.1 Teacher Cognition and Technology Integration:
Teacher cognition plays an important role in shaping EFL teachers' attitude towards technology in the classroom (Chen & Abdullah, 2022; Zhao & Zhang, 2022). This includes

ISSN E: 2709-8273
ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL
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teachers' beliefs about its significance, use, and alignment with objectives of teaching. The Technological Pedagogical Content Knowledge (TPACK) framework is largely use to analyse the relationship (Huang et al., 2022). EFL teachers' self-reliance and confidence in using technology is very important. Those teachers who believe in their knowledge and command over digital tools are more likely to incorporate the technology into their teaching (Lailiyah & Cahyono, 2017).

2.2 Factors Influencing Technology Integration:

A number of various factors influence the use, or vice versa, of technology in language classrooms. Factors such as training opportunities, relevant equipment, and a teacher friendly environment, help to enhance integration and learning (Shen et al., 2024). On the other hand, hurdles such as lack of interest in technology, foiba or unwillingness to change, may affect the progress (Mercader, 2020). Teachers with positive thinking and experiences with digital tools are more inclined to use it in the classroom for creative purposes (Paetsch et al., 2023).

2.3 Technology in ELT:

Technology integration in EFL classrooms can improve student motivation and autonomy (Ahmad, 2012). Interactive platforms, mobile applications, and online resources enhance learners' exposure to the language and support integrated skill development (Hani, 2021; Huang et al., 2022). Social media and online forums also facilitate collaborative learning (Allam & Elyas, 2016). However, successful implementation depends on how well technology aligns with pedagogical objectives and the broader learning context (Ding et al., 2019).

2.4 The Pakistani Context:

English language teachers in Pakistani universities come across various challenges such as resources deficiency and eccentric trend in policies (Awan, 2022). Although English language enjoys an unrivalled prestige, most of the times, students and teachers consider it as a second or third language, sometimes fourth even. Technology is considered to providing access to authentic materials and enhance learning experiences helping teachers receive the required support (Alshehri, 2024). Unfortunately, in Pakistan, service training programs for English teachers often neglect the integration and use of technology, promoting old fashion ways of teaching.

While a number of studies have explored teacher cognition about technology integration in various EFL contexts, however, there remains a paucity of research examining how these factors link and interact in academic in Pakistan.

This study attempts to fill this gap by investigating how Pakistani EFL teachers' cognition shaped by both internal factors and external realities which influences their technology integration practices. By employing the TPACK framework within this unexplored context, the research attempts to offer insight for understanding of the challenges and opportunities specific to Pakistani universities.

3. Methodology

This study used a qualitative phenomenological research design to record EFL teachers' experiences with technology integration in Pakistan. The phenomenological approach was adopted with a view that it allowed for detailed analysis of how teachers perceive, interpret, and link their experiences with educational technology (Creswell & Poth, 2018).

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ISSN P:2709-8265
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3.1 Participant Selection

This study used purposive sampling to select five Pakistani EFL university teachers from the Khyber Pakhtunkhwa province of Pakistan. Selection criteria required minimum five years' continuous teaching at postgraduate level and holding MPhil degree in the relevant subject.

3.2 Data Collection Procedures:

Data collection for the study took eight weeks. Five English language teachers from five different universities in Khyber Pakhtunkhwa (KP) were interviewed. Each participant took part in a 45–60-minute semi-structured interview. The interviews were recorded using a Sony recorder and later transcribed using ELAN software.

3.3 Data Analysis Process:

For the data analysis, I followed Braun and Clarke's (2006) thematic analysis framework. I engaged with the interview transcripts, reading them repeatedly to identify key patterns. NVivo software was used to conduct systematic line-by-line coding, which helped group the data into categories that were later developed into themes. To ensure validity, two independent coders verified the thematic structure. In the final phase, these themes were integrated with existing theoretical perspectives from the literature.

4. Findings and Analysis

The analysis of interview data revealed four interconnected themes that shape Pakistani EFL teachers' engagement with technology in higher education. These themes highlight cognitive, institutional, and pedagogical dimensions that influence technology adoption.

4.1 Beliefs About Technology and Its Pedagogical Value:

Teachers' beliefs about technology's role in ELT varied, though most acknowledged its potential to enhance learning. A dominant subtheme was the perception of technology as a motivational tool. Participants frequently mentioned that digital resources (for example, videos, interactive quizzes, and language apps) increased student engagement.

"When I use YouTube clips for listening exercises, students pay more attention than during traditional audio drills. They even discuss the content afterward." (Participant 3)

However, some teachers expressed ambivalence, questioning whether technology always contributed to deeper learning. A recurring concern was the risk of superficial integration—using digital tools for novelty rather than pedagogical necessity.

"PowerPoint slides can make lectures visually appealing, but if they're just bullet points copied from a textbook, are we really enhancing learning?" (Participant 1)

This tension reflects a broader debate in educational technology: whether tools are being used transformatively (redefining instruction) or merely substitutionally (replicating traditional methods digitally) (Puentedura, 2006).

4.2 Digital Competence and Professional Development Needs:

A critical finding was the gap between willingness to use technology and actual competence. Many teachers reported self-taught digital skills, often learned through trial and error during the COVID-19 pandemic.

"I had to figure out Zoom and Google Classroom on my own. The university provided no training—just an expectation that we'd switch to online teaching overnight." (Participant 2)

Following are the two key subthemes emerged:

Generational Differences: Younger faculty were generally more comfortable experimenting with technology, whereas senior teachers struggled with basic digital literacy.

ISSN E: 2709-8273
ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL
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Vol.8.No.3 2025

Demand for Pedagogically Focused Training: Teachers wanted not just technical training but guidance on integrating technology into language teaching effectively.

"I know how to use Kahoot, but how do I design quizzes that actually reinforce grammar rules rather than just testing recall?" (Participant 5)

This aligns with Mishra and Koehler's (2006) TPACK framework, which emphasizes that effective technology integration requires intersections of technological, pedagogical, and content knowledge.

4.3 Institutional and Infrastructural Barriers

The most frequently cited challenge was institutional constraints, particularly in public universities. Key issues included: Unreliable internet and electricity outages. Lack of multimedia-equipped classrooms. Minimal technical support.

"Our 'smart' classroom has a projector, but no one maintains it. Half the time, it doesn't work, so I just use the whiteboard." (Participant 4)

Interestingly, private university teachers reported better infrastructure but highlighted administrative inefficiencies, such as delayed approvals for software licenses or restrictive IT policies.

These findings support Ertmer's (1999) distinction between: First-order barriers (external, e.g., lack of resources). Second-order barriers (internal, e.g., teacher resistance).

In Pakistan, first-order barriers appear more debilitating, suggesting that even motivated teachers face structural impediments.

4.4 Attitudes Toward Pedagogical Change and Innovation

Despite challenges, most teachers expressed cautious optimism about technology's potential. Some had experimented with: Blended learning, Flipped classrooms and WhatsApp for peer discussions and feedback.

"I share podcast links before class, then we analyse them together. It saves time and lets us focus on critical thinking." (Participant 3)

However, teachers emphasized the need for: Time to adapt (transitioning to tech-enhanced teaching requires preparation). Peer collaboration (for instance, communities of practice where teachers share strategies). This suggests that while teachers are not resistant to change, they require systemic support to implement it sustainably.

5. Discussion

The current study shows that institutional policies play a vital role in shaping teacher cognition regarding the adoption and use of technology in the classroom, alongside teachers' personal experiences and knowledge. This finding challenges the traditional emphasis on teacher beliefs as the primary determinants of technology integration (Ertmer & Ottenbreit-Leftwich, 2013). While teachers expressed a willingness to integrate and use technology in their classrooms, many were unable to do so due to a lack of necessary infrastructure. This supports Selwyn's (2017) critique of technologically deterministic approaches in educational research.

The relationship between teachers' willingness and struggle and administrative constrained about the integration of technology emerges as a vital finding. Some teachers reported that they had developed their own resources and trained themselves using online resources or peer collaboration confirming Tour's (2017) observations about teachers' individual efforts which mostly proved insufficient without the support form the institution. Teachers who successfully integrated technology in their classroom were provided basic infrastructure and training by their institution affirms the ecological perspective that sees technology adoption as taking place within interconnected systems of various factors (Zhao & Frank, 2003).

There are various assumptions and practices within the classroom that change over time. The findings of the current study challenge Prensky's (2001) digital native hypothesis by arguing

ISSN E: 2709-8273
ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL
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that being proficient in the use of technology does not necessarily mean that teachers will use it effectively in the classroom. It has been observed that novice teachers, although skilled in technology, often struggle with its integration in language classrooms. In contrast, experienced teachers create joyful learning environments through the use of effective strategies and teaching techniques. These observations clearly support Bennett and Maton's (2010) view that experience and pedagogical knowledge contribute more to productive teaching than mere technological proficiency by novice instructors in language classes.

The study provides valuable and in-depth insight into how individuals adapt technology use to suit their specific teaching contexts. EFL teachers often seek solutions to cope with outdated or weak infrastructure. They design materials and activities that require little or no internet access. These strategies are designed, modified, and adopted according to local challenges, rather than relying on complaints or expressing frustration over infrastructure issues. This supports the idea that technology use in developing countries and teaching contexts should emphasize blended or technology-cum-traditional teaching approaches (Toyama, 2015; Unwin, 2009). The findings suggest that technology integration is not about maximizing the use of technology, but about using available resources in the most effective and context-appropriate way.

The phenomenological approach uncovered significant emotional dimensions of technology integration that quantitative studies often overlook. Teachers described frustration when institutional realities prevented implementation of their technological visions, alongside anxiety about keeping pace with rapid digital change. These emotional experiences highlight the importance of considering teacher wellbeing in professional development programs (Howard & Mozejko, 2015). However, the data also revealed remarkable resilience and creativity among participants, who continued pursuing their professional goals despite constraints, demonstrating the complex nature of teacher agency (Priestley, 2011).

These findings suggest that effective technology integration policies must address multiple interconnected dimensions: cognitive factors including teacher beliefs and knowledge, emotional aspects such as confidence and stress management, institutional elements including infrastructure and support systems, and pedagogical considerations focusing on effective integration strategies. This multifaceted perspective aligns with Luckin's (2010) "ecology of resources" model, which recognizes educational technology as operating within complex networks of interacting factors.

6. Conclusion

This study has explored how technology in education, in general, and in English language classrooms, in particular, is used to enhance teaching and learning. The findings reveal a complex relationship between technology integration and English language teacher cognition, shaped by both internal and external factors that influence teachers' beliefs. This research pens a more comprehensive understanding of EFL teacher cognition in relation to institutional realities and policies, compared to previous studies that analysed these factors in isolation.

Teacher cognition is shaped and developed through experience, education, and reflection, rather than through isolated pondering over classroom practices. Administrative factors also play a crucial role, as institutional policies significantly influence teacher beliefs and practices concerning the use of technology in classrooms.

The study carries several implications for relevant stakeholders. Teacher training programs should not only train faculty in using educational technologies but also encourage their practical application. Heads of institutions should request funding from higher authorities to establish or upgrade infrastructure for training teachers in technology integration. This

ISSN E: 2709-8273
ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL

research also underscores the importance of reflective teaching and the sharing of effective strategies in technology-integrated classrooms.

Furthermore, the study identifies several directions for future research. Longitudinal studies could provide insights into how teacher cognition evolves over time. Similarly, comparative studies could help examine how contextual variations across regions and institutions affect technology adoption. In addition, incorporating students' perspectives on classroom technology use would offer a more holistic understanding of its impact on teaching and learning.

In conclusion, this research argues that the integration of technology into English language classrooms in Pakistan requires pedagogical, institutional, and cognitive reform, supported by sincere efforts and effective implementation. The Higher Education Commission (HEC) must support EFL teachers by providing training in technology-integrated teaching and assessment practices.

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