UZBEK EFL TEACHERS' DIGITAL TECHNOLOGY INTEGRATION: PERCEPTIONS, CHALLENGES, AND PROFESSIONAL DEVELOPMENT NEEDS

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Abstract: The rapid development of digital technologies has significantly influenced contemporary English language education. Digital platforms, multimedia resources, learning management systems, and artificial intelligence (AI)-based tools have created new opportunities for improving teaching practices and supporting students' language learning. However, the effective integration of these technologies depends not only on the availability of digital resources but also on teachers' perceptions, technological confidence, institutional support, and contextual conditions.

This study investigates Uzbek EFL teachers' digital technology integration practices by examining their technology-related attitudes, perceived challenges, and professional development needs. A mixed-methods research design was employed. Quantitative data were collected through an online questionnaire completed by 150 English language instructors working in different educational institutions across Uzbekistan. The collected data were analyzed using descriptive statistics, Pearson correlation analysis, Welch's independent-samples t-test, and Welch's ANOVA. In addition, qualitative responses from an open-ended question were analyzed through thematic analysis.

The findings showed that teachers' positive attitudes toward digital technologies were significantly associated with higher levels of technology usage. The results also indicated that teachers frequently encountered several challenges, including insufficient technological equipment, unstable internet connectivity, and limited access to digital devices among students. Furthermore, participants expressed a strong need for professional development opportunities related to interactive learning platforms, learning management systems, artificial intelligence tools, and digital content creation.

The study suggests that successful technology integration in Uzbek EFL classrooms requires a combination of teacher readiness, improved infrastructure, institutional support, and continuous professional development. The findings provide useful implications for educational policymakers, administrators, and teacher educators seeking to promote effective digital transformation in English language education.

Keywords: digital technology integration; EFL teachers; technology acceptance; perceived barriers; professional development; Uzbekistan

1. Introduction

In recent years, digital technologies have become an important part of educational transformation worldwide. The development of online learning platforms, mobile applications, multimedia materials, and artificial intelligence (AI)-based educational tools has changed traditional approaches to teaching and learning. In English as a Foreign Language (EFL) education, digital technologies provide opportunities for teachers to introduce authentic language materials, increase student engagement, support collaborative learning, and create more flexible learning environments.

Previous studies have demonstrated that technology-enhanced language learning can contribute to the improvement of students' motivation, communication skills, and learner autonomy. Digital tools allow learners to access various forms of language input beyond the traditional classroom environment. For example, online platforms and multimedia resources provide opportunities for students to practice listening, speaking, reading, and writing skills through interactive activities.

However, the successful implementation of digital technologies does not automatically occur simply because technological resources are available. Teachers remain one of the most important factors influencing whether educational technologies are effectively integrated into classroom practices. Teachers' beliefs, confidence, digital competence, institutional support, and teaching conditions may influence their willingness and ability to use technology.

The Technology Acceptance Model (TAM), introduced by Davis (1989), explains that individuals' adoption of technology is mainly influenced by perceived usefulness and perceived ease of use. According to this model, teachers are more likely to integrate technology when they believe that digital tools can improve their teaching effectiveness and when they feel confident using these technologies.

In Uzbekistan, educational digitalization has become an important priority in recent years. Various initiatives have encouraged the integration of information and communication technologies (ICT) into educational institutions. In particular, English language education has increasingly incorporated online resources, digital platforms, and AI-supported applications. Nevertheless, the practical implementation of digital technologies remains challenging due to differences in infrastructure, internet accessibility, teacher training opportunities, and institutional support.

Previous studies conducted in Uzbekistan have mainly focused on teachers' perceptions of artificial intelligence, digital literacy, or the general benefits of educational technologies. For example, Toshmatov (2026) reported that university instructors generally demonstrated positive attitudes toward AI-based educational tools. Similarly, Sabirova et al. (2024) emphasized the potential of AI and Web 2.0 technologies in supporting language learning. However, limited research has examined how different factors, including teachers' attitudes, perceived barriers, teaching

experience, and institutional context, are related to actual technology usage among Uzbek EFL teachers.

Therefore, the purpose of this study is to explore digital technology integration among Uzbek EFL teachers by examining the relationships between teachers' technology-related attitudes, perceived barriers, and technology usage. In addition, the study aims to identify the main challenges teachers experience and explore their professional development needs related to digital technologies.

The following research questions guided the study:

1. What are Uzbek EFL teachers' current levels of digital technology usage, attitudes, and perceived barriers?
2. Is there a relationship between teachers' technology-related attitudes and digital technology usage?
3. What challenges do teachers experience when integrating digital technologies into English language teaching?
4. What types of professional development opportunities do teachers need for more effective technology integration?

2. Theoretical Background

2.1 Technology Integration in EFL Education

Digital technology integration in language education has received increasing attention because of its potential to create more interactive and student-centered learning environments. Unlike traditional teaching methods that mainly rely on textbooks and teacher explanations, technology-supported instruction enables learners to access diverse resources and participate in more meaningful communication activities.

Durriyah and Zuhdi (2018) highlighted that digital communication platforms can support collaboration and interaction among EFL learners. Similarly, Vakhobova et al. (2025) reported that technology-enhanced learning environments may contribute to learners' communicative and pragmatic competence.

Nevertheless, technology integration is a complex process influenced by multiple factors. Widayoko et al. (2026) emphasized that successful implementation depends on teachers' attitudes, technological competence, facilitating conditions, and institutional support. Therefore, examining teachers' experiences and perceptions is essential for understanding the real situation of digital technology use in educational settings.

2.2 Teachers' Attitudes toward Digital Technologies

Teachers' attitudes are considered one of the important factors affecting technology adoption. According to TAM (Davis, 1989), positive perceptions of usefulness and ease of use encourage individuals to accept and apply new technologies.

Recent studies have supported this relationship. Pokrivcakova (2023) found that EFL teachers generally showed positive attitudes toward AI technologies, while

Nguyen and Nguyen (2026) reported that teachers with stronger beliefs in the value of AI demonstrated greater readiness for technology integration.

However, positive attitudes alone may not always result in frequent classroom implementation. Teachers may recognize the advantages of digital technologies but still face practical limitations such as lack of training, insufficient equipment, or limited institutional support.

2.3 Challenges in Digital Technology Integration

Although educational technologies provide various benefits, teachers frequently encounter barriers during implementation. Previous research has identified several common challenges, including inadequate infrastructure, unstable internet connection, lack of professional training, and limited administrative support (Abbasi et al., 2021; Urunbayeva, 2025).

These barriers are especially important in developing educational contexts, where technological resources may not be equally available across institutions. Therefore, understanding teachers' challenges is necessary for developing effective strategies to support sustainable digital transformation.

3. Methodology

3.1 Research Design and Participants

This study employed a mixed-methods research design to investigate factors influencing digital technology integration among Uzbek EFL teachers. The quantitative part of the study focused on examining the relationships between teachers' technology-related attitudes, perceived barriers, teaching experience, institution type, and digital technology usage. The qualitative component was included to gain deeper insights into teachers' practical experiences, challenges, and professional development needs related to educational technology integration.

The participants of the study were 150 English language instructors from different educational institutions across Uzbekistan. The participants represented various educational contexts, including schools, lyceums, colleges, universities, institutes, and private educational centers. A convenience sampling method was used because participants were recruited through professional teacher networks and online educational communities.

Regarding teaching experience, participants had different levels of professional backgrounds. The largest group consisted of teachers with 1–3 years of experience, followed by teachers with 4–6 years of experience. Participants with more than ten years of experience also contributed to the study, allowing the research to consider perspectives from both early-career and experienced teachers.

3.2 Research Instrument

Data were collected through an online questionnaire developed using Google Forms. The questionnaire consisted of several sections designed to measure demographic

characteristics, digital technology usage, perceived barriers, technology-related attitudes, and professional development needs.

The digital technology usage section examined how frequently teachers used different digital tools in English language teaching, including presentation software, video and audio materials, interactive learning platforms, learning management systems, artificial intelligence tools, and mobile learning applications.

Teachers' perceived barriers were measured through questions related to technological infrastructure, internet accessibility, teacher training opportunities, institutional support, and time limitations. Technology-related attitudes were examined through statements regarding teachers' perceptions of usefulness, confidence, institutional encouragement, and the importance of digital technologies in English language education.

In addition, an open-ended question was included to allow participants to describe their opinions regarding the support needed for more effective technology integration.

3.3 Data Analysis

The collected quantitative data were analyzed using Jamovi statistical software. Descriptive statistics were calculated to summarize participants' characteristics and responses. Pearson correlation analysis was conducted to examine relationships between technology-related attitudes, perceived barriers, and digital technology usage.

Furthermore, Welch's independent-samples t-test was conducted to compare technology usage between different institution types, while Welch's ANOVA was used to examine differences based on teaching experience groups. These statistical methods were selected because they are appropriate when group sizes and variance conditions are not equal.

The qualitative responses were analyzed using thematic analysis following Braun and Clarke's (2006) framework. The responses were coded and organized into major themes related to professional development, infrastructure, and access to digital resources.

4. Findings and Discussion

4.1 Relationship between Teachers' Attitudes and Digital Technology Usage

The findings indicated a statistically significant positive relationship between teachers' technology-related attitudes and their digital technology usage ($r = .211$, $p = .016$). This result suggests that teachers who demonstrated more positive perceptions toward digital technologies tended to use digital tools more frequently in their English language classrooms.

This finding supports the Technology Acceptance Model proposed by Davis (1989), which emphasizes that perceived usefulness and positive beliefs about technology influence users' acceptance and adoption behaviors. Similar findings have been reported in previous studies showing that teachers with stronger confidence and more

favorable attitudes toward digital technologies are more likely to integrate technology into their instructional practices (Pokrivcakova, 2023; Nguyen & Nguyen, 2026).

However, the relatively small correlation coefficient suggests that positive attitudes alone may not fully explain technology integration. Teachers may recognize the importance of digital technologies but still experience practical limitations that affect their classroom implementation.

4.2 Perceived Barriers and Technology Usage

An interesting finding of the study was the significant positive relationship between perceived barriers and digital technology usage ($r = .382$, $p < .001$). Although previous research often suggests that barriers negatively influence technology adoption, the current finding indicates a more complex relationship.

One possible explanation is that teachers who frequently use digital technologies become more aware of the challenges associated with implementation. Teachers who actively apply digital tools in their lessons may encounter more technical problems, infrastructure limitations, and difficulties related to classroom management. Therefore, higher levels of reported barriers may reflect greater practical experience with technology rather than resistance to technology adoption.

This finding highlights the importance of considering barriers not only as factors preventing technology use but also as indicators of teachers' actual engagement with digital tools.

4.3 Influence of Teaching Experience and Institution Type

The results showed that teaching experience did not have a statistically significant influence on digital technology usage ($p = .479$). This finding suggests that years of teaching experience alone do not determine whether teachers use digital technologies in their classrooms.

Similarly, the comparison between school-level and university-level instructors showed no statistically significant difference in technology usage ($p = .691$). Although university instructors reported slightly higher average usage levels, the difference was not statistically.

These findings indicate that technology integration may depend more strongly on contextual factors, such as access to resources, professional training, and individual motivation, rather than demographic characteristics.

4.4 Challenges in Digital Technology Integration

The study revealed several important challenges faced by Uzbek EFL teachers when integrating digital technologies. The most frequently reported problems were insufficient technological equipment (45.3%), unstable internet connectivity (44.0%), and students' limited access to digital devices (38.7%).

Additionally, teachers reported difficulties related to limited preparation time, insufficient training opportunities, and lack of institutional encouragement.

These findings are consistent with previous research indicating that infrastructure and professional development remain major factors influencing educational technology implementation (Abbasi et al., 2021; Urunbayeva, 2025).

Although many teachers expressed positive attitudes toward technology, the results demonstrate that effective digital transformation requires supportive educational environments rather than relying only on teachers' willingness.

4.5 Teachers' Professional Development Needs

The participants showed strong interest in improving their knowledge and skills related to digital technologies. Interactive learning platforms such as Kahoot and Quizizz were among the most requested tools, followed by learning management systems, AI-based tools, and video creation technologies.

The qualitative findings further emphasized three major areas of support:

1. Professional development and practical training;
2. Improved technological infrastructure;
3. Greater access to modern digital resources.

Many participants indicated that practical workshops and continuous guidance would increase their confidence in applying digital technologies in English language classrooms.

These findings suggest that teacher training programs should focus not only on introducing digital tools but also on demonstrating how these tools can be effectively integrated into language teaching practices.

5. Conclusion

This study examined factors influencing digital technology integration among Uzbek EFL teachers by focusing on teachers' attitudes, perceived barriers, teaching experience, institution type, and professional development needs.

The findings demonstrated that teachers' positive attitudes toward digital technologies were associated with higher levels of technology usage. In addition, perceived barriers showed a significant relationship with technology usage, suggesting that teachers who actively use digital tools may become more aware of practical challenges during implementation.

The study also revealed that teaching experience and institution type did not significantly influence teachers' technology usage. Instead, technology integration appears to be shaped by contextual factors, including infrastructure availability, professional training opportunities, and institutional support.

The results highlight the importance of developing systematic professional development programs for EFL teachers in Uzbekistan. Providing practical training, improving digital infrastructure, and ensuring access to modern educational technologies may support more sustainable technology integration.

Although the study focused on Uzbek EFL teachers, its findings may provide useful implications for other developing educational contexts where institutions are working toward digital transformation. Future research may investigate technology integration through classroom observations, interviews, or longitudinal approaches to gain a deeper understanding of teachers' digital practices.

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