

Uzbek teachers' perception of the current practice application of technology in English class and their challenges

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Abstract: The integration of digital technologies has become increasingly important in English as a Foreign Language (EFL) education; however, the factors influencing teachers' actual technology usage remain underexplored in the Uzbek context. This study investigated the relationships among teachers' technology-related attitudes, perceived barriers, teaching experience, institution type, and digital technology usage among EFL instructors in Uzbekistan. In addition, it explored the challenges teachers encounter and their professional development needs for integrating digital technologies into English language teaching.

A mixed-methods research design was employed. Quantitative data were collected through an online questionnaire completed by 150 EFL instructors from various educational institutions across Uzbekistan. The questionnaire measured digital technology usage, technology-related attitudes, perceived barriers, and demographic characteristics. Quantitative data were analyzed using Pearson correlation, Welch's independent-samples t-test, and Welch's ANOVA, while qualitative responses to an open-ended question were analyzed using thematic analysis.

The findings revealed a statistically significant positive relationship between teachers' technology-related attitudes and digital technology usage ($r = .211$, $p = .016$). A significant positive relationship was also identified between perceived barriers and digital technology usage ($r = .382$, $p < .001$), suggesting that teachers who use digital technologies more frequently may become more aware of implementation-related challenges. In contrast, teaching experience ($p = .479$) and institution type ($p = .691$) were not significantly associated with technology usage. The most frequently reported challenges were insufficient technological equipment, unstable internet connectivity, and limited student access to digital devices. Participants also expressed strong interest in professional development related to interactive learning platforms, learning management systems, artificial intelligence tools, and video creation technologies.

The study concludes that digital technology integration among participating Uzbek EFL instructors is influenced primarily by teachers' technology-related attitudes, contextual barriers, and professional development needs rather than demographic characteristics. The findings provide practical implications for policymakers, educational administrators, and teacher educators seeking to strengthen digital technology integration through improved infrastructure, institutional support, and targeted professional development initiatives.

Keywords: Digital technology integration; EFL teachers; educational technology; technology-related attitudes; perceived barriers; professional development; Uzbekistan.

Introduction: In recent years, digital technologies have become an integral component of English as a Foreign Language (EFL) education worldwide. The rapid development of learning management systems, mobile applications, Web 2.0 tools, multimedia resources, and

artificial intelligence (AI)-powered technologies has transformed traditional teaching practices and encouraged more interactive, learner-centered, and technology-enhanced learning environments (Davis, 1989; Gupta et al., 2026; Sun et al., 2026). These

innovations provide language learners with increased access to authentic materials, personalized learning opportunities, immediate feedback, and collaborative learning experiences. Consequently, digital technologies are increasingly recognized as essential tools for improving language learning outcomes and preparing students for participation in a digitally connected world.

A growing body of research demonstrates that technology-enhanced language learning can positively influence learner engagement, motivation, communicative competence, and overall language development. Durriyah and Zuhdi (2018), for example, found that digital communication platforms support interaction, collaboration, and language practice among EFL learners. Similarly, Vakhobova et al. (2025) reported that technology-enhanced learning environments contribute to the development of pragmatic competence, while Sabirova et al. (2024) highlighted the potential of AI and Web 2.0 technologies to promote learner autonomy and authentic language use. These findings suggest that digital technologies have become increasingly important in contemporary language education.

However, successful technology integration depends on more than the availability of technological tools. Previous studies consistently indicate that teachers play a central role in determining whether educational technologies are adopted and effectively implemented in classroom practice. Teachers' perceptions, digital competence, institutional support, and contextual conditions all influence technology integration decisions (Doğan & Geçikli, 2026; Nguyen & Nguyen, 2026; Widayoko et al., 2026). According to the Technology Acceptance Model (TAM), individuals are more likely to adopt technology when they perceive it as useful and easy to use (Davis, 1989). Therefore, understanding the factors that influence teachers' technology-related behaviors remains an important area of educational research.

Within Uzbekistan, ongoing educational reforms and national digitalization initiatives have accelerated efforts to integrate information and communication technologies into English language education. Recent studies suggest that Uzbek EFL teachers generally demonstrate positive perceptions toward digital technologies and AI-powered educational tools

(Toshmatov, 2026; Saydazimova & Saydazimova, 2025). Furthermore, digital technologies have been recognized as valuable resources for enhancing learner engagement, supporting language development, and improving instructional effectiveness (Sabirova et al., 2024; Vakhobova et al., 2025). Nevertheless, despite these positive developments, teachers continue to encounter challenges related to technological infrastructure, internet accessibility, professional development opportunities, and institutional support (Akhmedjanova et al., 2023; Urunbayeva, 2025). These challenges may influence the extent to which digital technologies are integrated into everyday teaching practices.

Although previous research has examined various aspects of technology integration, several important gaps remain. Many studies have focused on individual factors such as teachers' attitudes toward AI, digital literacy, technology readiness, or institutional support in isolation (Pokrivcakova, 2023; Toshmatov, 2026; Saydazimova & Saydazimova, 2025). Relatively few studies have simultaneously investigated how teachers' technology-related attitudes, perceived barriers, teaching experience, and institutional type relate to actual digital technology usage within the Uzbek EFL context. Furthermore, limited research has combined quantitative measures of technology integration with qualitative insights regarding teachers' professional development needs and support requirements.

To address these gaps, the present study investigates the relationships among technology-related attitudes, perceived barriers, teaching experience, institution type, and digital technology usage among Uzbek EFL instructors. In addition, the study explores the challenges teachers encounter when integrating digital technologies and identifies the digital tools and professional development opportunities they consider most valuable. By providing a comprehensive examination of these technology-related factors within a single mixed-research framework, this study contributes to the growing literature on technology-enhanced language learning and offers practical implications for policymakers, educational administrators, and teacher educators seeking to promote effective digital technology integration in Uzbekistan.

Although previous studies have examined teachers'

attitudes, digital literacy, AI readiness, or institutional barriers separately, relatively little research has investigated how these factors jointly relate to actual digital technology usage among EFL teachers, particularly in the Uzbek context. Furthermore, existing studies in Uzbekistan have primarily focused on AI adoption or technology integration within specific educational settings, leaving limited evidence regarding the combined influence of teachers' attitudes, perceived barriers, teaching experience, and institution type on actual classroom technology use.

This study contributes to the existing literature in three important ways. First, it simultaneously examines teachers' technology-related attitudes, perceived barriers, teaching experience, and institution type within a single research framework. Second, it combines quantitative and qualitative evidence through a mixed-methods design to provide a more comprehensive understanding of digital technology integration. Third, it offers context-specific evidence from Uzbekistan, where empirical research on teachers' actual digital technology usage remains limited.

Therefore, the study aims to examine the relationships between teachers' technology-related attitudes, perceived barriers, teaching experience, institution type, and digital technology usage among Uzbek EFL instructors using a mixed-methods survey design. In addition, it explores teachers' professional development needs and suggestions for improving digital technology integration through qualitative responses.

Research Questions

- RQ1: What are the levels of teachers' attitudes, institutional support, barriers, and digital technology usage?
- RQ2: How do institutional support and barriers influence teachers' attitudes?
- RQ3: How do teachers' attitudes influence digital technology usage?
- RQ4: Do institution type and teaching experience significantly affect digital technology usage?

Hypotheses

H1. Teachers' technology-related attitudes are positively associated with digital technology usage.

H2. Perceived barriers are significantly associated with

digital technology usage.

H3. Digital technology usage differs according to teachers' years of teaching experience.

H4. Digital technology usage differs according to institution type.

LITERATURE REVIEW

1. Digital Technology Integration in EFL Education

The integration of digital technologies into English as a Foreign Language (EFL) education has become one of the most prominent developments in contemporary language teaching. The rapid expansion of digital platforms, learning management systems, mobile applications, multimedia resources, Web 2.0 technologies, and, more recently, artificial intelligence (AI)-based tools has fundamentally transformed how English is taught and learned. Rather than serving merely as supplementary instructional resources, digital technologies now facilitate interactive, learner-centered, and flexible learning environments that promote greater learner engagement, collaboration, autonomous learning, and access to authentic language input (Durriyah & Zuhdi, 2018; Gupta et al., 2026).

Recent research suggests that successful technology integration depends on far more than the availability of digital resources. Instead, technology adoption is shaped by a combination of teachers' technology-related attitudes, digital competence, institutional support, technological infrastructure, and contextual conditions. Widayoko et al. (2026) argued that teachers' attitudes, facilitating conditions, institutional support, and technological competence collectively influence their willingness and ability to integrate technology into classroom instruction. Similarly, Vakhobova et al. (2025) emphasized that technology-enhanced learning environments can significantly improve learners' communicative competence when teachers integrate digital tools through pedagogically appropriate instructional practices.

In Uzbekistan, educational modernization policies and ongoing digital transformation initiatives have accelerated the integration of information and communication technologies (ICT) across different educational sectors. Educational institutions have increasingly adopted digital platforms, online learning environments, multimedia resources, and AI-supported applications to improve teaching quality and expand

learning opportunities. Nevertheless, previous studies indicate that technology integration remains uneven across institutions due to differences in infrastructure, institutional support, teachers' digital readiness, and access to professional development opportunities (Akhmedjanova et al., 2023; Urunbayeva, 2025). Consequently, although digital technologies are becoming more accessible, considerable variation still exists in how frequently and effectively EFL teachers incorporate these technologies into their classroom practices.

These observations suggest that technology integration cannot be adequately explained by technological availability alone. Rather, understanding teachers' technology use requires examining individual, institutional, and contextual factors that influence technology adoption. Consequently, this study examines how teachers' technology-related attitudes, perceived barriers, teaching experience, and institution type are associated with digital technology usage among Uzbek EFL instructors.

2. Teachers' Technology-Related Attitudes

Teachers' technology-related attitudes have consistently been identified as among the strongest predictors of educational technology adoption. One of the most influential theoretical frameworks explaining this relationship is the Technology Acceptance Model (TAM) developed by Davis (1989), which proposes that individuals' intentions to adopt technology are primarily determined by two key beliefs: perceived usefulness and perceived ease of use. In educational contexts, teachers who perceive digital technologies as useful, practical, and manageable are generally more willing to integrate them into their instructional practices.

Recent empirical research provides substantial evidence supporting this theoretical perspective. Pokrivcakova (2023) reported that pre-service EFL teachers generally demonstrated positive attitudes toward artificial intelligence and educational technologies, which enhanced their readiness for technology integration. Similarly, Nguyen and Nguyen (2026) found that teachers with more favorable attitudes of AI exhibited greater preparedness to incorporate intelligent technologies into English language teaching. Likewise, Doğan and Geçikli (2026) demonstrated that higher levels of digital literacy were

positively associated with teachers' attitudes toward ICT integration and their willingness to adopt technology-supported instructional practices.

Evidence from Uzbekistan also supports the importance of teachers' technology-related perceptions. Toshmatov (2026) found that university EFL instructors generally viewed AI-powered educational tools positively and recognized their usefulness for lesson preparation, instructional material development, and classroom activities. Nevertheless, the study also suggested that favorable perceptions alone do not necessarily guarantee frequent classroom implementation, indicating that contextual and institutional factors may simultaneously influence teachers' technology usage.

Taken together, the existing literature consistently suggests that teachers who hold more positive attitudes toward digital technologies are more likely to integrate these technologies into their teaching practices.

H1: Teachers' overall technology-related attitudes (Total_Attitude) are significantly and positively related to their digital technology usage (Total_Usage).

3. Perceived Barriers to Technology Integration

Despite the recognized benefits of educational technology, teachers frequently encounter various barriers that hinder effective technology integration. Although digital technologies offer considerable pedagogical advantages, previous research has consistently shown that successful classroom implementation depends not only on teachers' willingness to adopt technology but also on the availability of institutional resources, infrastructure, and professional support. Previous studies commonly classify these barriers into technical, institutional, pedagogical, and personal categories.

Abbasi et al. (2021) identified inadequate infrastructure, insufficient training, lack of institutional support, and limited access to technological resources as major obstacles affecting English language teachers' technology integration. Similarly, Mehdaoui (2024) reported that technical challenges, lack of professional development opportunities, and anticipated resistance significantly influence teachers' readiness to adopt emerging technologies.

Evidence from diverse educational contexts further supports these findings. Rubadeau (2018) found that

institutional expectations, organizational structures, and administrative demands significantly shaped teachers' technology-related decisions in South Korean educational settings. Likewise, Al-Jarf (2026) highlighted that infrastructure quality and institutional support remain critical determinants of successful technology implementation. Within Uzbekistan, Urunbayeva (2025) reported that EFL teachers frequently experience challenges associated with insufficient equipment, unreliable internet connectivity, and limited professional training opportunities.

Interestingly, recent educational technology research suggests that perceived barriers may not simply indicate resistance to technology. Rather, teachers who actively integrate digital tools into their teaching are often more likely to recognize and report operational challenges because of their greater exposure to real classroom implementation. This perspective implies that perceived barriers may coexist with active technology use rather than necessarily preventing it. To empirically examine this relationship without assuming a predetermined direction, the following hypothesis is proposed:

H2. Perceived barriers (Total_Barriers) are significantly related to digital technology usage (Total_Usage).

4. Teaching Experience and Technology Usage

The relationship between teaching experience and technology adoption has received considerable attention in educational technology research; however, empirical findings remain inconclusive. Some studies suggest that less experienced teachers may be more willing or confident to integrate digital technologies because of greater exposure to digital environments, whereas other studies argue that experienced educators possess stronger pedagogical knowledge that enables more effective and meaningful technology integration.

Recent empirical evidence reflects these mixed findings. Regli et al. (2026) found that teaching experience alone was not a reliable predictor of ICT integration, emphasizing instead the importance of institutional and contextual factors. Similarly, Nyairo (2026) reported that technological readiness among EFL teachers was influenced more strongly by technological knowledge and professional training than by years of teaching experience. Zhang (2023) likewise concluded that

contextual factors frequently exert a greater influence on teachers' digital literacy development than demographic characteristics such as age or teaching experience.

Given these inconsistent findings, further empirical investigation is needed to determine whether years of teaching experience are associated with digital technology usage among Uzbek EFL instructors. Therefore, the following hypothesis is proposed:

H3: There is a statistically significant difference in digital technology usage (Total_Usage) based on instructors' years of teaching experience.

5. Institutional Context and Technology Usage

Institutional context is another important factor frequently associated with technology integration. Educational institutions differ considerably in terms of technological infrastructure, financial resources, institutional policies, and professional development opportunities, all of which may influence teachers' access to digital technologies and their ability to integrate them effectively into classroom instruction.

Chouit et al. (2017) reported a significant relationship between institutional support and technology usage among university instructors. Likewise, Rubadeau (2018) demonstrated that organizational expectations and institutional policies shape teachers' technology-related practices. Within Uzbekistan, previous studies have reported unequal access to technological resources and digital learning infrastructure across educational settings, particularly between urban and regional institutions (Akhmedjanova et al., 2023; Urunbayeva, 2025). These disparities suggest that institutional context may influence teachers' opportunities to integrate digital technologies into their instructional practices.

To examine whether these structural and institutional differences are associated with digital technology usage among Uzbek EFL instructors, the following hypothesis is proposed:

H4: There is a statistically significant difference in digital technology usage (Total_Usage) between school-level and university-level instructors.

6. Professional Development Needs and Emerging Technologies

As educational technologies continue to evolve,

teachers increasingly require continuous professional development to remain effective users of digital tools. Recent research indicates growing interest in AI-powered educational technologies such as ChatGPT, Grammarly, and other intelligent learning applications.

Sabirova et al. (2024) emphasized the educational potential of AI and Web 2.0 technologies for enhancing language learning outcomes. Similarly, Saydazimova and Saydazimova (2025) found that Uzbek teachers generally viewed AI positively but expressed a need for additional training and institutional guidance. Sun et al. (2026) also reported that teachers' willingness to adopt AI technologies is strongly associated with perceived usefulness and professional development opportunities.

Collectively, these findings suggest that continuous professional development remains essential for sustainable technology integration and may facilitate teachers' future adoption of emerging educational technologies. Since teachers' professional development needs were explored descriptively rather than inferentially, no formal hypothesis was proposed for this aspect of the study.

7. Research Gap

Previous research has demonstrated that teachers' technology-related attitudes, perceived barriers, teaching experience, institutional context, and professional development opportunities all play important roles in technology integration within language education. Nevertheless, several important gaps remain in the existing literature.

First, relatively few empirical studies have examined these factors simultaneously within the Uzbek EFL context. Most previous research has focused on a single dimension of technology integration, such as artificial intelligence adoption, digital literacy, teacher attitudes, or institutional support, without considering how these variables collectively influence teachers' technology usage.

Second, limited empirical evidence exists regarding the relationships among teachers' technology-related attitudes, perceived barriers, teaching experience, institution type, and digital technology usage in Uzbekistan. Consequently, little is known about the relative contribution of these factors to teachers' actual use of digital technologies in English language

classrooms.

Third, although recent studies have explored teachers' perceptions of AI and digital technologies, relatively little attention has been paid to integrating quantitative findings with qualitative evidence that captures teachers' practical experiences, challenges, and professional development needs. To the best of the author's knowledge, no previous study has simultaneously combined quantitative measures of technology usage, attitudes, and perceived barriers with qualitative insights from teachers' open-ended responses within a single investigation of Uzbek EFL instructors.

Therefore, the present study seeks to address these gaps by examining the relationships among teachers' technology-related attitudes (Total_Attitude), perceived barriers (Total_Barriers), teaching experience, institution type, and digital technology usage (Total_Usage) through a mixed-methods approach that integrates quantitative statistical analyses with qualitative thematic analysis. By doing so, the study aims to provide a more comprehensive understanding of the factors influencing digital technology integration among Uzbek EFL instructors and to offer evidence-based implications for educational policy, teacher education, and future research.

METHODOLOGY

1. Research Design

This study employed a mixed-methods research design, in which quantitative survey data served as the primary source of evidence, while qualitative data obtained from a single open-ended question provided complementary insights into teachers' experiences and professional development needs. Survey research is widely used in educational technology studies because it enables researchers to collect data from relatively large groups of participants and examine relationships among variables such as technology-related attitudes, perceived barriers, and technology usage (Gupta et al., 2026; Widayoko et al., 2026). The study focused on identifying English language instructors' patterns of digital technology use, perceived barriers, technology-related attitudes, and professional development needs regarding digital technologies and artificial intelligence (AI) in English language teaching.

2. Participants

The participants consisted of 150 English language instructors from different regions of Uzbekistan. Participants were recruited using a non-probability convenience sampling technique through accessible educational institutions and professional networks. Convenience sampling was selected because it enabled efficient access to English language instructors working across diverse educational settings throughout Uzbekistan.

Respondents represented a variety of educational contexts, including schools, lyceums, colleges, universities, institutes, and private learning centers.

Regarding teaching experience, 38.0% of participants had between one and three years of teaching experience, 26.7% had four to six years of experience, 14.0% had more than ten years of experience, 11.3% had seven to ten years of experience, and 10.0% had less than one year of experience. With respect to institutional affiliation, 48.6% of participants worked in schools, lyceums, or colleges, while 45.9% were university instructors. The remaining respondents represented other educational institutions. This distribution provided an opportunity to compare technology integration practices across different educational contexts.

3. Instrumentation

Data were collected using a self-administered online questionnaire developed through Google Forms. The questionnaire consisted of nine sections and included both closed-ended and open-ended questions.

The first three sections collected demographic information, including teaching experience, institution type, and geographical region.

The fourth section examined the frequency of digital technology use in English language teaching (Total_Usage). Participants reported how frequently they used seven categories of digital tools, including presentation software, video materials, audio materials, interactive platforms, learning management systems, AI tools, and mobile learning applications. Responses were measured using a five-point Likert scale ranging from Never (1) to Always (5).

The fifth section explored the practical challenges instructors encountered when integrating digital

technology into their teaching using a multiple-response checkbox format.

The sixth section measured the perceived severity of barriers to technology integration (Total_Barriers), including lack of teacher training, inadequate infrastructure, insufficient institutional support, and lack of preparation time. Responses were recorded on a five-point Likert scale ranging from Not a problem (1) to A major problem (5). Similar barriers have frequently been identified in previous studies on educational technology integration (Abbasi et al., 2021; Mehdaoui, 2024).

The seventh section measured teachers' technology-related attitudes (Total_Attitude) using four Likert-scale statements addressing perceived usefulness of digital technology, confidence in technology use, institutional encouragement, and professional development needs. Responses were measured using a five-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5). Previous research has consistently demonstrated that teachers' attitudes and confidence are important predictors of technology adoption and classroom integration (Pokrivcakova, 2023; Zhang, 2023).

The eighth section examined participants' professional development needs by asking which digital technologies they would like to learn more about. Multiple responses were permitted.

The final section consisted of an open-ended question inviting participants to explain what would help them use digital technology more effectively in their English language classes.

4. Data Collection Procedure

The questionnaire was distributed online through institutional networks and professional social media platforms. Participation was entirely voluntary, and respondents were informed about the purpose of the study before completing the survey. Digital informed consent was obtained from all participants prior to participation. Data were collected between March and April 2026. All responses were anonymous, and participants were informed that they could discontinue participation at any stage without any consequences. These procedures were implemented to ensure participant confidentiality and encourage honest responses.

5. Data Analysis

The collected data were analyzed using Jamovi statistical software (Version 2.7) (The Jamovi Project, 2025), which operates on the R statistical computing environment (R Core Team, 2025).

Missing responses were primarily handled through mean-based composite score calculations in Jamovi. This procedure allowed respondents with occasional missing item responses to remain included when sufficient information was available for calculating composite variables. For inferential analyses, cases with missing values on variables required for a specific statistical procedure were excluded only from that analysis, resulting in slight variations in valid sample sizes across statistical tests.

Descriptive statistics, including frequencies, percentages, means, and standard deviations, were calculated to summarize participant characteristics and survey responses.

To evaluate the internal consistency of the measurement scales, Cronbach's alpha coefficients were calculated using the psych package integrated within Jamovi (Revelle, 2025). The Digital Technology Usage scale (Total_Usage) demonstrated high reliability ($\alpha = .837$), the Technology-related Attitude scale (Total_Attitude) demonstrated high reliability ($\alpha = .864$), and the Perceived Barriers scale (Total_Barriers) showed acceptable reliability ($\alpha = .731$). These results indicate satisfactory internal consistency for all composite scales used in the study.

Pearson correlation analysis was conducted to examine the relationships between teachers' technology-related attitudes, perceived barriers, and digital technology

usage. Pearson correlation was selected because the composite variables were treated as continuous measures and met the assumptions required for parametric correlation analysis.

A Welch independent-samples t-test was performed to compare digital technology usage between school-level and university-level instructors. In addition, a one-way Welch ANOVA was conducted to examine differences in technology usage across teaching experience groups. Welch procedures were selected because they provide more robust estimates when group sizes and variances are unequal.

Responses to the open-ended question were analyzed using thematic analysis following the framework proposed by Braun and Clarke (2006). Initial codes were generated from participants' responses and subsequently grouped into broader conceptual themes through an iterative coding process to identify recurring patterns regarding the structural, institutional, and pedagogical support teachers require for more effective technology integration in English language teaching.

RESULTS

1. Participant Characteristics

A total of 150 English language instructors participated in the study. Regarding teaching experience, the largest group consisted of instructors with 1–3 years of teaching experience (38.0%), followed by those with 4–6 years of experience (26.7%). Teachers with more than 10 years of experience represented 14.0% of the sample, while 11.3% had 7–10 years of experience and 10.0% had less than one year of teaching experience.

Table 1. Participants' Teaching Experience (N = 150)

Teaching experience	n	%
Less than 1 year	15	10.0
1–3 years	57	38.0
4–6 years	40	26.7
7–10 years	17	11.3
More than 10 years	21	14.0

In terms of institutional affiliation, 48.6% of participants worked in schools, lyceums, or colleges, whereas 45.9%

worked in universities. The remaining respondents represented institutes and other educational settings.

Table 2. Participants' Institution Type (N = 150)

Institution type	n	%
School/Lyceum/College	72	48.6
University	68	45.9
Institute	4	2.7
Other	4	2.7

2. Relationship Between Teachers' Technology-Related Perceptions and Digital Technology Usage (H1)

A Pearson correlation analysis was conducted to examine the relationship between teachers' technology-related perceptions (Total_Attitude) and digital technology usage (Total_Usage). Because of occasional missing responses, Pearson correlation analysis was conducted using valid paired observations only (N = 130).

The analysis revealed a statistically significant positive correlation between teachers' technology-related perceptions and digital technology usage, $r(128) = .21$, $p = .016$. This finding indicates that teachers who reported more favorable perceptions toward digital technologies tended to use digital tools more frequently in their English language teaching practices.

Therefore, H1 was supported.

Table 3. Pearson Correlation Between Teachers' Technology-Related Perceptions and Digital Technology Usage

Variables	1	2
1. Total_Usage	—	
2. Total_Attitude	.211*	—

Note: N = 130 valid paired observations. $p < .05$.

3. Relationship Between Perceived Barriers and Digital Technology Usage (H2)

A Pearson correlation analysis was performed to investigate the relationship between perceived barriers (Total_Barriers) and digital technology usage (Total_Usage). Because of occasional missing responses, Pearson correlation analysis was conducted using valid paired observations only (N=126).

The results demonstrated a statistically significant positive relationship between perceived barriers and technology usage, $r(124) = .38$, $p < .001$. Contrary to the commonly assumed negative relationship, instructors

who reported higher levels of digital technology use also tended to report more barriers.

This finding suggests that teachers who actively integrate technology into their teaching may become more aware of infrastructural, technical, and pedagogical challenges encountered during implementation.

Therefore, H2 was supported.

Additionally, a small but statistically significant positive relationship was observed between teachers' technology-related perceptions and perceived barriers, $r(127) = .20$, $p = .021$.

Table 4. Pearson Correlation Matrix

Variables	1	2	3
1. Total_Barriers	—		
2. Total_Usage	.382***	—	
3. Total_Attitude	.202*	.211*	—

Note. Pearson correlation coefficients are reported. * $p < .05$; ** $p < .001$.

4. Teaching Experience and Digital Technology Usage (H3)

A one-way Welch ANOVA was conducted to determine whether digital technology usage differed according to instructors' teaching experience.

The analysis revealed no statistically significant

differences among the five teaching-experience groups, $F(4, 42.2) = 0.89$, $p = .479$.

These findings indicate that years of teaching experience did not significantly influence the frequency of digital technology use among the participants.

Therefore, H3 was not supported.

Table 5. Welch ANOVA Results

Variable	F	df1	df2	p
Total_Usage	0.889	4	42.2	.479

Note. Welch one-way ANOVA was used because the assumption of homogeneity of variances was violated.

5. Institutional Differences in Digital Technology Usage (H4)

A Welch independent-samples t-test was conducted to compare digital technology usage between school/lyceum/college and university instructors.

Descriptive statistics indicated that university

instructors reported slightly higher levels of technology usage ($M = 3.10$, $SD = 0.87$) than school/lyceum/college instructors ($M = 3.04$, $SD = 0.73$). However, this difference was not statistically significant, $t(119) = -0.40$, $p = .691$.

Table 6

Group Descriptive Statistics for Digital Technology Usage by Institution Type

Institution Type	<i>N</i>	<i>M</i>	<i>SD</i>

School/Lyceum/College	67	3.04	0.73
University	62	3.10	0.87

To determine whether this observed difference was statistically meaningful, a Welch independent-samples t-test was performed.

Table 7

Welch Independent-Samples t-Test Comparing Digital Technology Usage by Institution Type

Test	<i>t</i>	<i>df</i>	<i>p</i>
Welch's <i>t</i> -test	-0.398	119	.691

These findings suggest that institutional affiliation did not significantly influence digital technology usage among the surveyed instructors.

Therefore, H4 was not supported.

6. Challenges Faced by Teachers in Using Digital

Technology

Participants were asked to identify the practical challenges they encounter when integrating digital technologies into English language teaching (see Table 8).

Table 8

Challenges Faced by Teachers When Using Digital Technology (Question 5)

Challenge	Frequency (%)
Insufficient equipment and technological resources	45.3
Unstable or no internet connection	44.0
Students lack access to digital devices	38.7

Lack of time to prepare digital lessons	32.0
Lack of training on digital tools	29.3
No institutional support or encouragement	21.3

Note. Participants were allowed to select more than one option; therefore, percentages do not total 100%.

The most frequently reported challenge was insufficient equipment and technological resources (45.3%), followed closely by unstable or unreliable internet connectivity (44.0%). Furthermore, 38.7% of participants indicated that students lacked adequate access to digital devices.

Other commonly reported challenges included lack of preparation time (32.0%), insufficient training opportunities (29.3%), and limited institutional support (21.3%).

Overall, the findings indicate that infrastructural limitations and resource-related constraints remain the most significant obstacles to effective technology integration.

7. Professional Development Needs

Participants were also asked which digital technologies they would most like to learn more about (Table 9).

Interactive learning platforms such as Kahoot and Quizizz were the most frequently selected option (55.0%), followed by learning management systems (51.7%). Interest in AI-based tools such as ChatGPT and Grammarly was also substantial (48.3%), while 47.7% of respondents expressed a desire to learn more about video creation technologies.

These findings suggest a strong demand for practical professional development opportunities focusing on contemporary digital tools and AI-assisted instructional technologies.

Table 9

Professional Development Needs Identified by Participants (Q8)

Digital Tool	Frequency (%)
Interactive platforms (e.g., Kahoot, Quizizz)	55.0
Learning Management Systems (Google Classroom, Moodle)	51.7
AI tools (e.g., ChatGPT, Grammarly)	48.3
Video creation tools	47.7

8. Open-Ended Responses

A thematic analysis of responses to Question 9

identified three major themes regarding factors that would facilitate more effective integration of digital

technology in English language teaching. The identified themes are summarized in Table 10.

Table 10
Themes Identified from the Open-ended Responses (Q9)

Theme	Representative ideas
Professional development and training	Workshops, hands-on training, tutorials, guidance, and practical experience
Infrastructure and technological resources	Stable internet, Wi-Fi, laptops, tablets, smart boards, projectors
Access to modern digital tools	AI tools, ChatGPT, educational applications, premium subscriptions, and interactive platforms

The first and most frequently occurring theme was professional development and training. Many participants emphasized the importance of practical workshops, hands-on training sessions, and continuous guidance on integrating digital technologies into classroom instruction. One participant commented:

"I think the most important thing that would help me use digital technology more effectively in my English classes is proper training and practical experience. If I had more hands-on training through workshops or short courses, I would feel more confident integrating technology into my lessons."

Similarly, another respondent stated:

"I think proper training for teachers and access to effective digital tools would help me use digital technology more effectively in my English classes."

The second theme concerned infrastructure and technological resources. Participants frequently mentioned the need for reliable internet connectivity, adequate technological equipment, and improved classroom facilities. One participant noted:

"I think having high-speed internet and modern laptops for every student is the most important. It would allow us to use online resources without any delays."

Many other respondents similarly emphasized stable internet access, Wi-Fi, projectors, smart boards,

laptops, and tablets as essential resources for successful technology integration.

The third theme focused on access to modern digital tools and artificial intelligence applications. Participants expressed interest in AI-powered technologies such as ChatGPT, educational applications, interactive learning platforms, and premium digital resources that could enhance student engagement and improve instructional effectiveness.

Overall, the qualitative findings complement the quantitative results by demonstrating that teachers view professional training, reliable infrastructure, and access to modern digital technologies as the three most important conditions for improving technology integration in English language teaching. Taken together, the qualitative and quantitative findings provide a more comprehensive understanding of the factors influencing digital technology integration among Uzbek EFL teachers and strengthen the overall interpretation of the study findings.

DISCUSSION

The present study investigated the relationships between teachers' overall technology-related attitudes, perceived barriers, teaching experience, institution type, and digital technology usage among EFL instructors in Uzbekistan. The findings provide

important insights into the factors associated with technology integration in English language teaching and extend the existing literature on educational technology adoption within developing educational contexts, particularly Uzbekistan.

The first finding revealed a statistically significant positive relationship between teachers' technology-related attitudes and digital technology usage. This result supports H1 and suggests that instructors who hold more favorable professional attitudes toward digital technologies tend to use them more frequently in their teaching practices. This finding is consistent with the Technology Acceptance Model (TAM) proposed by Davis (1989), which emphasizes perceived usefulness and perceived ease of use as major determinants of technology adoption. The result also aligns with previous studies indicating that positive attitudes and digital literacy toward educational technology encourage greater technology integration (Pokrivcakova, 2023; Doğan & Geçikli, 2026; Nguyen & Nguyen, 2026). In the Uzbek context, the finding is similar to Toshmatov (2026), who reported generally positive attitudes of AI tools among university instructors. The observed relationship, although modest in magnitude, indicates that teachers' professional perceptions remain an important determinant of classroom technology integration. Collectively, these findings suggest that fostering positive attitudes and confidence in the use of technology may increase teachers' willingness to integrate digital tools into classroom instruction.

The second finding demonstrated a statistically significant positive relationship between perceived barriers and digital technology usage. This result supports H2 and represents one of the most interesting findings of the study. At first glance, the result appears inconsistent with traditional research, which generally reports that barriers reduce technology integration (Abbasi et al., 2021; Mehdaoui, 2024; Urunbayeva, 2025). However, a possible explanation is that teachers who use technology more frequently become more acutely aware of the practical and operational challenges associated with daily implementation. In other words, active technology users encounter infrastructural, technical, and pedagogical obstacles more often because they engage with diverse tools on a regular basis. This pattern may reflect increased

exposure to implementation-related challenges among active technology users rather than cognitive resistance to technology itself. Similar patterns were observed in previous studies where teachers with positive attitudes toward technology simultaneously reported infrastructural and institutional challenges that constrained implementation (Mehdaoui, 2024; Doğan & Geçikli, 2026). Furthermore, Rubadeau (2018) found that technology users frequently faced organizational and institutional constraints despite maintaining positive attitudes toward digital innovation.

The findings further indicated that teaching experience did not significantly influence digital technology usage. Therefore, H3 was not supported. This result is consistent with studies suggesting that demographic variables alone are weak predictors of technology adoption and digital literacy development (Zhang, 2023; Regli et al., 2026). Similarly, Nyairo (2026) reported that technological readiness and competence were influenced more strongly by explicit training opportunities than by cumulative years of teaching experience. The absence of significant differences among experience groups suggests that digital technology use has become increasingly widespread across different generations of teachers. This finding may reflect the growing availability of digital technologies and the widespread normalization of technology-enhanced teaching practices following the digital shifts initiated during the pandemic era (Akhmedjanova et al., 2023).

The fourth finding showed no statistically significant difference in technology usage between school-level and university-level instructors. Consequently, H4 was not supported. Although university instructors reported slightly higher mean scores descriptively, the difference was statistically negligible. This finding contrasts with some previous studies that reported stark institutional disparities in technological resources and support (Akhmedjanova et al., 2023; Urunbayeva, 2025). One possible explanation is that digital technologies and educational applications are becoming increasingly accessible across the different educational sectors represented in the current sample, narrowing historical institutional gaps. Another possible explanation is that this alignment indicates that teachers in both primary/secondary and higher education contexts within this study face comparable technological

opportunities and shared regional structural constraints.

The descriptive findings revealed that insufficient equipment, unstable internet connectivity, and students' limited access to digital devices were the most frequently reported challenges (see Table 8). These findings strongly correspond with previous research conducted in Uzbekistan and other developing educational contexts (Abbasi et al., 2021; Akhmedjanova et al., 2023; Urunbayeva, 2025). The persistence of these challenges highlights that unequal access to technological resources and digital learning infrastructure remains a critical issue affecting the transformation of language education (Akhmedjanova et al., 2023).

The professional development results indicated substantial interest in interactive platforms, learning management systems, AI tools, and video creation technologies (see Table 9). These findings support previous research showing increasing teacher interest in AI-supported educational technologies and Web 2.0 tools (Sabirova et al., 2024; Saydazimova & Saydazimova, 2025; Sun et al., 2026). The strong demand for training suggests that while teachers recognize the pedagogical value of digital technologies for enhancing learner autonomy and communicative competence (Sabirova et al., 2024), they require structured institutional professional development to use them effectively and confidently.

The qualitative findings from the open-ended question further reinforced the quantitative results. Participants consistently emphasized the critical need for professional development opportunities, improved technological infrastructure, and greater access to modern digital tools. The strong convergence between quantitative metrics and qualitative thematic accounts strengthens the overall credibility of the study and highlights the importance of addressing both technological and institutional factors simultaneously. These qualitative findings reinforce the quantitative evidence by demonstrating that teachers are generally willing to adopt digital technologies; however, sustainable technology integration requires a coordinated combination of reliable infrastructure, continuous professional development, institutional support, and access to appropriate digital resources.

These findings contribute to the growing literature on technology-enhanced language learning by providing empirical evidence from the Uzbek EFL context. They also offer practical guidance for policymakers, educational administrators, and teacher educators seeking to design evidence-based strategies that support sustainable and effective digital technology integration across educational institutions.

Overall, the findings suggest that technology integration among the participating Uzbek EFL instructors is shaped by a complex interplay of attitudes, contextual barriers, and professional development needs rather than by demographic characteristics such as teaching experience or formal institution type. Taken together, the findings indicate that successful technology integration depends not only on teachers' attitudes but also on the availability of institutional resources and professional development opportunities. These results contribute to the growing literature on technology-enhanced language learning and provide practical implications for policymakers, educational administrators, and teacher educators seeking to promote effective digital technology integration in Uzbekistan.

LIMITATIONS

Several limitations should be considered when interpreting the findings of this study.

First, although 150 EFL instructors participated in the study, the participants were not evenly distributed across all regions of Uzbekistan. A substantial proportion of respondents were from Fergana and Tashkent, which may limit the generalizability of the findings to all EFL teachers across the country. Therefore, the results should be interpreted as representative of the participating instructors rather than the entire national teaching population.

Second, the study relied primarily on self-reported survey data. While self-report instruments are widely used in educational technology research, participants' responses may have been influenced by personal attitudes, social desirability bias, or differences in the interpretation of survey items. Future studies could complement survey data with classroom observations, interviews, or actual technology usage records to obtain a more comprehensive understanding of teachers' technology integration practices.

Third, the study employed a cross-sectional research design, collecting data at a single point in time. Consequently, the findings identify associations among variables but do not establish causal relationships. Longitudinal research could provide deeper insights into how teachers' attitudes, perceived barriers, and digital technology usage evolve.

Finally, the quantitative analyses were limited to Pearson correlation, Welch independent-samples t-test, and Welch ANOVA. While these statistical procedures were appropriate for addressing the research questions of the present study, future research could employ more advanced analytical techniques, such as multiple regression or structural equation modeling (SEM), to investigate the complex relationships among technology-related factors more comprehensively.

Despite these limitations, the study provides valuable empirical evidence regarding digital technology integration among Uzbek EFL instructors and contributes to the growing body of research on technology-enhanced language education in developing educational contexts.

CONCLUSION

This study examined the relationships among teachers' technology-related attitudes, perceived barriers, teaching experience, institution type, and digital technology usage among EFL instructors in Uzbekistan. The findings contribute to the growing body of research on technology-enhanced language education by providing empirical evidence regarding the factors associated with digital technology integration in a developing educational context.

The results revealed that teachers' technology-related attitudes were positively associated with digital technology usage, indicating that instructors who held more positive attitudes toward digital technologies tended to use them more frequently in their teaching practices. Additionally, a significant positive relationship was identified between perceived barriers and technology usage. This finding suggests that teachers who actively integrate technology into their instruction become more aware of the practical challenges associated with implementation, including infrastructural, technical, and pedagogical constraints. In contrast, teaching experience and institution type

were not found to influence technology usage significantly, indicating that technology integration may be shaped more strongly by contextual and professional factors than by demographic characteristics.

The study also highlighted several practical challenges affecting technology integration. Insufficient equipment, unstable internet connectivity, and limited student access to digital devices emerged as the most frequently reported barriers. At the same time, participants expressed strong interest in professional development opportunities related to interactive platforms, learning management systems, AI-powered tools, and video creation technologies.

Qualitative findings further emphasized the importance of professional training, infrastructure improvement, and access to modern educational technologies.

Taken together, the findings suggest that successful technology integration depends not only on teachers' positive attitudes but also on the availability of institutional resources, technological infrastructure, and continuous professional development opportunities. Therefore, educational policymakers, administrators, and teacher educators should prioritize investments in digital infrastructure, targeted training programs, and institutional support systems that enable teachers to integrate technology effectively into English language teaching.

Future research could expand on the present study by including larger, more geographically representative samples from different regions of Uzbekistan. Longitudinal studies and advanced statistical approaches, such as multiple regression or structural equation modeling, could further clarify the complex relationships among technology-related factors. In addition, future studies may explore how emerging technologies, particularly artificial intelligence, influence English language teaching practices and learner outcomes across diverse educational contexts.

Overall, this study provides valuable insights into digital technology integration among Uzbek EFL instructors and underscores the importance of creating supportive technological and institutional environments that promote sustainable and effective technology-enhanced language education.

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