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Hungarian English major teacher trainees' attitudes towards the use of technology in the EFL classroom: Piloting a questionnaire

Mai Nelly Kaw
Eötvös Loránd University, Hungary
mainelly@student.elte.hu

ABSTRACT

In today's globalized world, mastering both language and technology is crucial (Huang et al., 2019). Ng and Yunus (2021) emphasize the need for 21st-century teachers to integrate technology into language teaching. Teacher preparation should enhance pre-service teachers' comfort with using technology (Koch et al., 2012). The present study reports the development and piloting process of a questionnaire that investigates Hungarian English major teacher trainees' attitudes towards using technology in English as a Foreign Language (EFL) classrooms. Despite extensive research on technology integration in EFL settings, there is a scarcity of studies on the attitudes of Hungarian English major teacher trainees towards using technology in tertiary-level EFL classrooms. This study seeks to fill this gap by exploring the attitudes of Hungarian English major teacher trainees on the use of technology in the EFL classroom. Adapted from the TPACK Survey by Schmidt et al. (2009), this quantitative pilot study aims to design a questionnaire based on six constructs: general attitudes towards technology, attitudes towards using technology to learn and teach English, perceived usefulness, ability to use technological tools, and willingness to use technology. Forty-three Hungarian English major teacher trainees participated in the survey. The questionnaire's reliability was confirmed using Cronbach's alpha coefficients. Results showed that teacher trainees have positive attitudes towards using technology in general and for learning and teaching English. They find technological tools beneficial, are proficient in using them, and are willing to integrate technology into their teaching practices. There is a strong positive relationship between their attitudes towards technology and their willingness and perceived ability to use it. The findings may enhance understanding of Hungarian EFL teacher trainees' attitudes towards technology, aiding in the development of effective training and resources to foster technology use in EFL teaching.

Keywords: EFL; English major teacher trainees; Hungarian tertiary education; pilot questionnaire study; technology integration

INTRODUCTION

The 21st century skills have become increasingly important for students' learning, future careers, and personal lives, with teachers identified as key to educational reform and innovation (Butler & Schnellert, 2012). The global integration of technology has heightened the need for mastering both language and information technology (Delgado et al., 2015; Huang et al., 2019). Parette and Blum (2013) emphasize that technology integration is vital in the 21st-century educational environment. Ng and Yunus (2021) state that society's growing adoption of technology demands that teachers effectively integrate technology into language teaching. During the global Covid-19 crisis, when various aspects of human life were severely restricted, technology played a supportive role in sustaining teaching and learning activities (Thaheem et al., 2021).

Koch et al. (2012) emphasize that teacher preparation should enhance pre-service teachers' comfort with pedagogical resources, including technology, which is crucial in higher education. Focusing on teachers' attitudes towards technology integration is vital for effective English language

teaching and for student teachers to acquire essential 21st-century skills. Research shows that modern teachers are expected to facilitate learning, create productive environments, and integrate technology into teaching (Okojie et al., 2006).

The integration of technological tools is essential for overcoming learners' challenges, such as speaking the target language during the outbreak (Ying et al., 2021). As the world becomes increasingly globalized, technology facilitates our access to more advanced knowledge, science, and information, which can be utilized as a medium for enhancing teaching and learning (Zhao, 2005). Technologies like the internet offer potential uses beyond learning, including communication, career planning, and fostering greater and more meaningful participation (Abbasi, 2020). This is because technology provides crucial learning tools that enable students to engage in cooperative learning and explore exciting alternatives for language skill development through experimentation (Ahmadi, 2017). Using internet-based technology for language learning can enhance student-centred learning and motivate learners to become autonomous and active participants (Ahmadi, 2017; Ammade et al., 2018). Given that technology is becoming an integral component of the learning process, it is crucial to provide future English teachers with training on effectively integrating technology into the classroom (Habibi et al., 2019). Numerous studies have also highlighted the crucial role of technology tools in higher education (Nagy & Habok, 2018). If trainees used technology tools more actively during their university studies, they would be more likely to apply technology methods frequently in their teaching practice (Yeni & Gecu-Parmaksiz, 2016).

Despite numerous studies on technology integration in education, there is a scarcity of research on English major teacher trainees' attitudes toward using technology in tertiary-level EFL classrooms in Hungary. This study aims to address this gap by investigating Hungarian English major teacher trainees' attitudes towards technology integration in EFL teaching. The findings may contribute to the literature on technology-enhanced language teaching and may inform teacher education programs and educational policies, aiding the effective integration of technology into EFL classrooms.

Schmidt et al. (2009) describe technology as a broad concept that encompasses various elements, particularly digital tools such as computers, laptops, iPods, handheld devices, interactive whiteboards, and software programs. The term "technology integration" has been used without a clear, standard definition (Belland, 2009; Hew & Brush, 2007). Many educators use this term to distinguish between using technology to enhance learning effectiveness and using it to help students solve problems (Belland, 2009). Palloff and Pratt (2000) argue that technology integration is an integral part of the pedagogical process and the instructional delivery of a set curriculum.

The theoretical framework employed in this study to investigate technology integration in education is the TPACK (Technological Pedagogical and Content Knowledge) framework. Originally proposed by Shulman (1986) and later expanded by Mishra and Koehler (2006), the TPACK framework serves as a useful tool for assessing the readiness of EFL pre-service teachers to integrate technology in the EFL classroom. This framework comprises three core dimensions: Content Knowledge (CK), Pedagogical Knowledge (PK), and Technological Knowledge (TK), along with their intersections: Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), Pedagogical Content Knowledge (PCK), and Technological Pedagogical and Content Knowledge (TPACK). These dimensions are interconnected, with CK focusing on subject content, PK on instructional methods, and TK on the technology utilized in teaching. The TPACK Survey, developed by Schmidt et al. (2009), is a well-established instrument used to measure teachers' self-perception of their TPACK. This survey employs a 5-point Likert scale, allowing (pre-service) teachers to report their confidence levels in TPACK across the seven domains of the framework. The survey has been widely adopted in various teacher training contexts and validated with different groups of pre-service and in-service teachers. In this study, the measurement of TPACK was based on the adapted Dutch version of Schmidt et al.'s (2009) TPACK self-report scale, as outlined by Voogt et al. (2012). Previous research has utilized TPACK instruments to explore factors influencing pre-service teachers' readiness to use technology. For instance, studies conducted by Rafiq et al. (2022), Bashir and Jimmy (2023), and Ali and Waer (2024) have investigated these factors. Additionally, Scherer et al. (2018) examined the combined impact of pre-service teachers' attitudes towards technology and the support received from their teacher training institution on their TPACK.

In recent years, the integration of technology into education has become increasingly prominent, especially in the realm of language teaching. Numerous studies have examined the attitudes of teachers and students towards the use of technology, revealing generally positive perceptions across various contexts and countries (e.g., Fekete, 2021; Gonen, 2019; Liang, 2021; Makhlouf & Bensafi, 2021). The findings of several key studies from both international and Hungarian contexts are presented in chronological order. Studies from international contexts are presented first, followed by studies from Hungarian contexts.

Akturk et al. (2015) examined pre-service teachers' attitudes towards the use of technology at a large university in central Turkey. The study involved 329 participants and used a relational survey model. Findings revealed generally positive attitudes towards the use of technology, with male pre-service teachers showing more positive attitudes than females. The duration of daily internet use emerged as the strongest predictor of these attitudes.

Gonen (2019) investigated the integration of technology in language teaching practices by pre-service teachers. The study revealed that the participants had positive attitudes towards technology-enhanced lessons, which improved English language skills, created a motivating learning environment, encouraged active participation, and allowed lessons to be tailored to students' needs and interests. Huang et al. (2019) examined the attitudes of 14 Chinese EFL teachers towards technology use. Results showed favourable attitudes, with younger and novice teachers more reliant on technology than their older, more experienced counterparts, who felt their deep subject knowledge compensated for the lack of technology. Noori (2019) explored Afghan EFL lecturers' attitudes towards instructional technology and found that these lecturers generally held positive views. The study indicated that gender, teaching experience, and educational qualifications did not significantly influence attitudes, while age and prior computer training did.

Ahmed et al. (2020) explored South Yemeni EFL tertiary teachers' attitudes towards the use of technology, their current use, and challenges faced. Findings indicated positive attitudes across the board, with no significant variation based on gender, academic level, or computer competence. However, actual technology use in classrooms was limited, largely due to lack of tools, internet access, and computer competence. The study emphasized the need for better technical resources and training. Laborda et al. (2020) examined pre-service teachers' attitudes towards integrated technology using the Course Blog Attitude Questionnaire. Findings indicated a positive view of blogs and social tools in education, although not as strong as anticipated, highlighting the continued relevance of these tools.

Liang (2021) conducted a mixed-method study examining university teachers' perceptions and use of technology in mainland China's English language classrooms. The findings revealed that while teachers had positive perceptions of technology integration, they predominantly used it for teacher-centred purposes rather than actively engaging students. Teachers also noted more external barriers, such as insufficient training and the *Great Firewall*—an Internet censorship system in mainland China blocking many English-medium websites and resources (Mei et al., 2018)—compared to internal challenges like students' lack of interest in technology. Makhlouf and Bensafi (2021) investigated factors influencing teachers' attitudes towards technology use in teaching in Algeria. The study included 50 EFL teachers and employed a mixed-method approach. Positive attitudes towards technology integration were observed, with significant correlations between attitudes and variables such as personal characteristics and computer competence. Age and academic qualifications showed negative correlations. The study provided insights for improving technology implementation in education. Thanh et al. (2023) conducted a questionnaire study on Vietnamese tertiary EFL teachers' attitudes towards the use of technology in teaching English. The results indicated positive attitudes and readiness to use technology in teaching.

This section presents studies by Nagy and Habók (2018), Magyar et al. (2020), and Fekete (2021), conducted in the Hungarian context. Nagy and Habók (2018) conducted a quantitative study using an online questionnaire to examine university students' use of technology and their related perceptions. The study focused on attitudes towards technology, the frequency of technology use in general and in language learning contexts. Both language and non-language majors agreed on the motivational role and personal significance of technology. The results highlighted the substantial role of technology in learning, learner engagement, and efficacy, with language majors using language,

social, and media tools, as well as blogs and vlogs, more frequently. Online dictionaries and lexicons were the most commonly used tools.

Magyar et al. (2020) surveyed 121 Hungarian teachers to understand their perceptions of special educational needs (SEN) and their use of technology in teaching. The study found that teachers moderately used technology tools in their teaching, both for typically developing students and those with SEN. Teachers frequently used e-diaries, presentations, videos, films, and other audio materials. The findings indicated a preference for ready-made materials over teacher-created ones, highlighting a moderate and limited use of technology materials.

Fekete (2021) explored technology use among Hungarian English majors using a validated questionnaire with 15 constructs and data from 268 university students. The findings showed positive attitudes towards technology, driven more by recreational than educational purposes. The study emphasized the importance of digital competence and meaningful technology use beyond mere device ownership.

Extensive research has been conducted on technology integration in the EFL classroom; however, there remains a limited amount of research specifically focused on English major teacher trainees' attitudes toward the use of technology in the EFL classroom at the tertiary level in Hungary. To address this gap, this study aims to investigate the attitudes of Hungarian English major teacher trainees toward the use of technology in the EFL classroom.

RESEARCH METHODS

The following section comprises the research design, a detailed description of the methods of data collection (participants and setting, the instrument and the procedures) and the data analysis methods. On the basis of the literature review and in line with the aim of this study, the following research questions were formulated:

RQ1: Is the questionnaire a reliable tool for measuring the English major teacher trainees' attitudes towards the use of technology in EFL classroom in the Hungarian context?

RQ2: What are Hungarian English major teacher trainees' attitudes towards the use of technology in EFL classroom?

RQ3: Which measured dimension(s) predict Hungarian English major teacher trainees' willingness to use technological tools?

RQ4: Which measured dimension(s) predict Hungarian English major teacher trainees' perceptions of their ability to use technological tools?

Quantitative design

The questionnaire adapted for this study has been used in diverse contexts but not in Hungary. Therefore, this study aimed to check its reliability in the Hungarian context after some adaptations. The use of the quantitative research paradigm was further corroborated by the fact that quantitative questionnaires can be applied for their ability to address a large number of participants and provide generalizable results (Dörnyei, 2007). According to Dörnyei, questionnaires can gather three types of data: (1) factual information, including demographic details such as age, gender, race, residence, socio-economic status, education, occupation, language learning history, and time in an L2 environment; (2) behavioural data on actions, lifestyles, habits, and personal history; and (3) attitudinal data covering thoughts, attitudes, opinions, beliefs, interests, and values. Since the study aimed to investigate the attitudes of Hungarian English major teacher trainees towards the use of technology in the EFL classroom, a questionnaire was the most suitable data collection tool.

Participants and setting

The study was conducted with 43 Hungarian English major teacher trainees at a Hungarian university during the spring semester of 2023, using snowball sampling (Dörnyei, 2007). The number of participants can be assumed to provide enough data, as the ideal range for quantitative pilot research is typically at least 30 participants (Dörnyei, 2007). The sample consisted of Hungarian teacher trainees aged 22 to 28 (mean age = 23, SD = 1.49), with 31 females (72.1%) and 12 males (27.9%). Participants were at various stages of their studies (third to sixth year) and had differing levels of teaching experience: 7% with over five years, 34.9% with two to five years, 46.5% with less than two years, and 11.6% with no experience. Regarding teaching locations, six participants had taught in public schools, private schools, and provided one-on-one tutoring or private lessons. Three had taught in both public and private schools. Eleven had taught in public schools and provided one-on-one tutoring. Four had exclusively taught in public schools. Three had taught in private schools and provided one-on-one tutoring, and eleven had exclusively provided one-on-one tutoring or private lessons. According to the participants' self-reports, the level of participants' proficiency ranged from B2 to C2 on the Common European Framework of Reference (CEFR; Council of Europe, 2001). Within the questionnaire, the majority of participants (34 out of 43, or 79.1%) reported having a C1 level of English, while 8 out of 43 participants (18.6%) indicated a C2 level. Only one participant (2.3%) described his/ her English proficiency as B2. The participants' background data are summarized in Table 1.

Table 1. Overview of the Participants' Background Data

Total number of participants	Age	Gender		Teaching experience				Proficiency		
		Male	Female	More than five years	Two to five years	Less than two years	No teaching experience	B2	C1	C2
43	22 – 28 M = 23 St. D.= 1. 49%	12	31	3	15	20	5	1	34	8

Instrument

The data collection instrument was a questionnaire adapted from the TPACK Survey by Schmidt et al. (2009). The constructs and selection of questionnaire items were guided by the research questions, relevant theories, insights from existing literature, and expert judgment. Adaptations were made to ensure relevance to the specific research context. For example, the item "I can choose technologies that enhance student's learning for a lesson" was adapted to "I like choosing technologies that enhance students' learning for a lesson" to better capture attitudes towards technology use in English language teaching.

The questionnaire began with a brief message explaining the study's objectives, ensuring participant anonymity, and allowing for voluntary participation. Respondents rated items on a 5-point Likert scale (from strongly disagree to strongly agree). It took approximately 15 minutes to fill in the questionnaire. Besides the background variables, the pilot questionnaire consisted of six constructs that altogether included 56 items. To describe the constructs of the questionnaire, a list of them follows with the number of items they consisted of. A sample item of each construct is also provided.

1. Attitudes towards technology use in general (7 items): Sample item: *I like solving technical problems on my own.*
2. Attitudes towards technology use to learn English (12 items): Sample item: *I like using technological tools to learn vocabulary.*
3. Attitudes towards technology use to teach English (13 items): Sample item: *I like using various technologies in different teaching activities.*
4. Perceived usefulness of technological tools (10 items): Sample item: *Using technological tools can help me complete assignments.*
5. Perceived ability to use technological tools (8 items): Sample item: *I can use technological tools to share digital content related to English language learning.*
6. Willingness to use technology (6 items): Sample item: *I am willing to invest time to learn how to use technological tools in my EFL learning.*

Procedures of instrument validation and data analysis

The questionnaire was designed and refined through multiple validation steps, which included rewording and reorganizing questions based on expert feedback. A think-aloud pre-pilot was conducted with two volunteers to ensure the questions were interpreted as intended. For data collection, an initial email was sent to university EFL teachers requesting their assistance in recruiting teacher trainees interested in participating in a questionnaire study. The email outlined the research purpose, voluntary participation, use of pseudonyms for anonymity, data handling, absence of right or wrong answers, requesting honest opinions and personal experiences, estimated questionnaire duration, and the freedom to stop the questionnaire if the participants felt uncomfortable while filling it in. The language of the questionnaire was English as all the participants have good command of English, and the author does not have knowledge of the Hungarian language. They were required to have at least a B2 level of English, as mandated by the university for admission.

The questionnaire was administered online. Due to the absence of direct contact with the intended participants, the active link, in the form of a Google form, was emailed to the teacher trainers, requesting them to distribute it among their trainees, who then shared it with their teacher trainees through email or Moodle. Filling in the questionnaire was voluntary, and the respondents were granted anonymity. In the case of limited responses after being distributed the questionnaire for two weeks, a follow-up email was sent to the teacher trainers as a courtesy reminder politely asking them to remind their trainees to answer the questionnaire. The online survey tool "Google Forms" automatically recorded all the 43 responses. Subsequently, the data were exported into an SPSS (Statistical Package for Social Sciences) data set. SPSS version 27 was used for data analysis.

RESULTS AND DISCUSSION

Results

This section of the paper presents the results and discussion of our findings. The section is organized in accordance with the four research questions.

The internal reliability of the constructs

In order to answer the first research question (Is the questionnaire a reliable tool for measuring the English major teacher trainees' attitudes towards the use of technology in EFL classroom in the Hungarian context?), the internal reliability of the constructs of the questionnaire, Cronbach's alpha internal consistency reliability coefficients were computed, which are shown in Table 2. According to George and Mallery (2003), an alpha value above .7 is acceptable.

Table 2. The Construct Reliability Analysis

Scale	Cronbach's alpha	Number of items (Total: 56)
A. Attitudes towards technology use in general	.933	7
B. Attitudes towards technology use to learn English	.939	12
C. Attitudes towards technology use to teach English	.958	13
D. Perceived usefulness of technological tools	.947	10
E. Perceived ability to use technological tools	.958	8
F. Willingness to use technology	.943	6

The Cronbach's alpha values were above .933 (see Table 2). These high values indicate strong internal consistency and reliability, suggesting the adapted items effectively measure English major teacher trainees' attitudes towards technology use in EFL contexts in the Hungarian context.

Descriptive statistics

In order to answer the second research question (What are the English major teacher trainees' attitudes towards the use of technology in EFL classrooms?), descriptive statistics, paired samples t-tests, and correlation analyses were conducted. Descriptive statistics for the scales are presented in

Table 3. Based on the descriptive statistics provided, the data for the three categories of attitudes were interpreted.

Table 3. Descriptive Statistics of the Scale

Scale	Mean	Sd. deviation
A. Attitudes towards technology use in general	3.78	1.02
B. Attitudes towards technology use to learn English	3.92	.84
C. Attitudes towards technology use to teach English	3.88	.93
D. Perceived usefulness of technological tools	4.01	.88
E. Perceived ability to use technological tools	3.95	1.00
F. Willingness to use technology	4.08	.95

The average *attitude towards technology use in general* among participants is moderately positive, with a mean score of 3.78 on a scale (from 1 to 5). The standard deviation of 1.02 indicates moderate variability in responses. The average *attitude towards using technology to learn English* is slightly more positive, with a mean score of 3.92 and a standard deviation of .84, suggesting relatively consistent responses. The average *attitude towards using technology to teach English* is also moderately positive, with a mean score of 3.88 and a standard deviation of .93, indicating moderate variability. Overall, participants have positive attitudes towards technology use, with the highest positivity towards using it for learning English. Variability in responses is moderate for general and teaching attitudes but lower for learning attitudes, indicating more consensus on the benefits of using technology to learn English.

Paired-samples t test

Table 4. Paired-sample t Test of the Attitudes towards Technology Use

		Mean	Sd. deviation	t	p
Pair 1	A-B	-.13843	.64574	-1.406	.167
Pair 2	A-C	-.09967	.56291	-1.161	.252
Pair 3	B-C	.03876	.39866	.638	.527

In examining attitudes towards technology use, the paired samples t-test results indicate no significant differences between general attitudes (A), *attitudes towards using technology to learn English* (B), and *attitudes towards using technology to teach English* (C). The comparison between *general attitudes and attitudes towards learning English* (A–B) showed a mean difference of -0.13843 ($t = -1.406$, $p = 0.167$), suggesting a slight, non-significant preference for technology use in learning English over general use. Similarly, the comparison between *general attitudes and attitudes towards teaching English* (A–C) showed a mean difference of -0.09967 ($t = -1.161$, $p = 0.252$), indicating a slight, non-significant preference for technology use in teaching English over general use. Lastly, the comparison between *attitudes towards using technology to learn and to teach English* (B–C) resulted in a mean difference of 0.03876 ($t = 0.638$, $p = 0.527$), showing no significant difference between these specific attitudes. Overall, for all three pairs (A–B, A–C, and B–C), the significance values (p-values) are greater than 0.05, indicating that the attitudes towards technology use in these different dimensions (general use, learning English, and teaching English) appear to be relatively consistent, with none of the differences between the paired groups are statistically significant.

Correlation analysis

To examine the correlational relationships between the constructs, a correlation analysis was conducted, revealing significant correlations.

Table 5. Significant Correlations ($p < .01$) between the Constructs

	A	B	C	D	E	F

A. Attitudes towards technology use in general	–					
B. Attitudes towards technology use to learn English	.776	–				
C. Attitudes towards technology use to teach English	.838	.904	–			
D. Perceived usefulness of technological tools	.771	**.962**	.896	–		
E. Perceived ability to use technological tools	.873	.919	**.951**	.928	–	
F. Willingness to use technology	.844	**.931**	**.936**	.925	**.941**	–

According to the table above, the correlation analysis between different *attitudes towards technology and its perceived usefulness*, *perceived ability to use it*, and *willingness to use it* reveals several significant relationships. The highest correlation observed is between *attitudes towards using technology to learn English* (B) and *perceived usefulness of technological tools* (D) (r = .962), indicating a very strong correlation. This suggests that individuals who perceive technology as useful are highly likely to have positive attitudes towards using it to learn English. Enhancing participant' *attitudes towards technology in learning English* is likely to significantly increase their perception of the usefulness of technological tools, which can be crucial for successful technology integration in educational settings.

Similarly, there is a very strong correlation between *attitudes towards using technology to teach English* (C) and *perceived ability to use technological tools* (E) (r = .951). This high correlation implies that those who feel confident in their ability to use technology are very likely to have positive attitudes towards using it to teach English. *Perceived ability to use technological tools* (E) is also highly correlated with *willingness to use technology* (F) (r = .941). This indicates that individuals who feel capable of using technology are very willing to use it, reflecting the importance of self-efficacy in technology adoption. The correlation between *attitudes towards using technology to teach English* (C) and *willingness to use technology* (F) (r = .936) suggests that those with positive attitudes towards teaching English with technology are also very willing to use technology in general.

Finally, the correlation between *attitudes towards using technology to learn English* (B) and *willingness to use technology* (F) (r = .931) shows a strong link, indicating that positive attitudes towards learning English with technology are closely associated with a general willingness to use technology. These high correlations highlight the interconnectedness of attitudes towards specific uses of technology (learning and teaching English) with general perceptions of usefulness, ability, and willingness to use technology. The data suggest that enhancing perceived usefulness and ability can significantly boost positive attitudes and willingness to use technology in educational contexts.

Regression analysis

Regression analysis was conducted to examine the relationship between the dependent variable and independent variables, and to answer RQs 3 and 4, "Which measured dimension(s) predict Hungarian English major teacher trainees' willingness to use technological tools?" and "Which measured dimension(s) predict Hungarian English major teacher trainees' perceptions of their ability to use technological tools?"

Table 6. Results of Regression Analysis of the Measured Dimensions on Hungarian English Major Teacher Trainees' Willingness to Use Technological Tools (significance level p < .01)

Variable	β	t	p	
E. Perceived ability to use technological tools	.298	1.858	.071	
B. Attitudes towards technology use to learn English	.369	3.178	.003	
C. Attitudes towards technology use to teach English	.319	2.150	.038	
$\mathbf{R^2}$				.92

Dependent variable: F (willingness to use technological tools)

The dependent variable *willingness to use technological tools* (F) can be predicted by the variables *perceived ability to use technological tools* (E), *attitudes towards technology use to learn English* (B), and *attitudes towards technology use to teach English* (C). The R-squared value is .92, indicating that 92% of the variance in *willingness to use technological tools* (F) can be explained by *perceived ability to use technological tools* (E), *attitudes towards technology use to learn English* (B),

and *attitudes towards technology use to teach English* (C). The beta coefficients indicate that *attitudes towards technology use to learn English* (B) has the strongest predictive power (.36), and that of *attitudes towards technology use to teach English* (C) is less (.32), and that of *perceived ability to use technological tools* (E) is even slightly less than that of *attitudes towards technology use to teach English* (.30).

Table 7. Results of Regression Analysis of the Measured Dimensions on Hungarian English Major Teacher Trainees' Perceptions of their Ability to Use Technological Tools (significance level p < .01)

Variable	β	t	p	
C. Attitudes towards technology use to teach English	.432	4.557	<.001	
D. Perceived usefulness of technological tools	.363	4.462	<.001	
A. Attitudes towards technology use in general	.231	3.501	.001	
R^2				.95

Dependent variable: E (Perceived ability to use technological tools)

The dependent variable, *the perceived ability to use technological tools* (E), can be predicted by the variables: *attitudes towards technology use to teach English* (C), *perceived usefulness of technological tools* (D), and *attitudes towards technology use in general* (A). The R-squared value is .95, meaning that 95% of the variance in the *perceived ability to use technological tools* (E) can be explained by these three predictors. The beta coefficients indicate *that attitudes towards technology use to teach English* (C) has the strongest predictive power (.43), followed by the *perceived usefulness of technological tools* (D) (.37), and *attitudes towards technology use in general* (A) (.23).

Discussion and implications

This section of the paper presents the discussion of findings and relates them to previous research. The section is organized according to the four research questions.

The validated questionnaire provided a basis for data analysis. With only 43 participants, the results are considered preliminary and not generalizable (Dörnyei & Csizér, 2012). However, the sample size (N=43) was deemed appropriate and acceptable for validating the instrument. To address RQ1 regarding the reliability of the questionnaire in assessing English major teacher trainees' attitudes towards technology use in EFL classrooms in Hungary, Cronbach's alpha coefficients were calculated to evaluate internal consistency reliability. The obtained Cronbach's alpha values exceeded .933, indicating robust internal consistency and reliability of the questionnaire constructs. These results suggest that the adapted questionnaire is a reliable tool for effectively measuring the attitudes of English major teacher trainees towards technology use, specifically in the context of teaching English as a foreign language in Hungary.

To examine attitudes towards technology use (RQ2), descriptive statistics, paired samples t-tests, and correlation analyses were conducted. Overall, the descriptive statistics indicate that participants hold positive attitudes towards technology use, especially in the context of learning English. Paired samples t-tests revealed consistent attitudes towards technology use in different dimensions (general use, learning English, and teaching English) in Hungary, with no statistically significant differences between paired groups. The strongest correlation observed was between *attitudes towards using technology to learn English* (B) and *perceived usefulness of technological tools* (D) (r = .962), indicating a robust relationship. The strong correlation between *attitudes towards using technology to learn English* (B) *perceived usefulness of technological tools* (D) suggests that improving the perceived utility of these tools can significantly enhance teacher trainees' attitudes towards their use in learning English. This suggests that individuals who perceive technology as useful are likely to have positive attitudes towards using it for learning English. Enhancing participants' attitudes towards technology in English learning could significantly boost their perception of technological tools' usefulness, crucial for successful technology integration in educational settings. This suggests that educators should focus on demonstrating the practical benefits and effectiveness of technological tools in the learning process. Given the positive attitudes towards technology use in learning English, educational institutions should prioritize the integration of digital tools and resources in English language curricula. This includes

incorporating interactive software, online learning platforms, educational apps, and other digital resources that facilitate language learning. By doing so, schools can harness teacher trainees' positive attitudes and increase engagement and motivation in English learning.

To ensure successful technology integration, it is crucial to provide future English teachers with ongoing professional development opportunities. Training programs should focus on developing teachers' skills in using technological tools effectively and creatively in their teaching practices. Workshops, webinars, and hands-on training sessions can help teacher trainees stay updated with the latest technological advancements and pedagogical strategies, ultimately enhancing their confidence and competence in using technology in the classroom. Since Hungarian English major teacher trainees already hold positive attitudes towards technology use, efforts should be made to sustain and further enhance these attitudes such as fostering an environment where technology is seen as an integral part of the educational experience. The robust relationship between perceived usefulness and positive attitudes towards technology use in learning English indicates that efforts to improve one aspect will likely benefit the other. Therefore, initiatives aimed at increasing the perceived usefulness of technological tools should be prioritized. This could include providing students with clear guidelines on how to use technology effectively, integrating technology in a way that aligns with their learning goals, and ensuring that the tools are user-friendly and accessible. By considering these pedagogical implications, educational institutions can create a more conducive environment for technology-enhanced learning, ultimately leading to improved educational outcomes and greater technological proficiency among teacher trainees and educators. The results align with previous research in international and Hungarian contexts (Ahmed et al., 2020; Fekete, 2020; Laborda et al., 2020; Liang, 2021; Makhlouf & Bensafi, 2021; Thanh et al., 2023). These studies similarly emphasize the effectiveness and benefits of technology for language learning, reinforcing the positive attitudes observed in our study.

Regression analysis was conducted to explore the relationships between participants' *willingness to use technological tools* (F) and *perceived ability to use technological tools* (E), *attitudes towards technology use to learn English* (B), and *attitudes towards technology use to teach English* (C). The high R-squared value of .92 implies that *willingness to use technological tools* is strongly influenced by *perceived ability*, *attitudes towards using technology to learn English*, and *attitudes towards using technology to teach English.* Among these, attitudes towards using technology to learn English have the most substantial impact. This suggests that efforts to increase the willingness to use technological tools should prioritize improving attitudes towards using technology for learning English. Additionally, enhancing the perceived ability to use these tools and fostering positive attitudes towards using technology for teaching can further encourage the adoption of technological tools. Since *attitudes towards using technology to learn English* have the most substantial impact on *willingness to use technological tools*, educators should focus on cultivating positive attitudes towards technology use in learning environments. This can be achieved by showcasing the benefits and effectiveness of technological tools in improving learning outcomes, integrating them into engaging and interactive lessons, and demonstrating their real-life applications. Improving teacher trainees' confidence in their ability to use technological tools is crucial. Professional development programs for teacher trainees should include training on effective use of technology, and they should receive support to build their skills and familiarity with these tools. Developing positive attitudes towards using technology for teaching can further support the integration of these tools. Combining efforts to improve attitudes towards technology use for learning, enhance perceived ability, and foster positive teaching attitudes will collectively boost the willingness to adopt technological tools.

In addressing RQ4 concerning *perceived ability to use technological tools*, the study reveals that the R-squared value of .95 implies that this ability is strongly predicted by *attitudes towards technology use to teach English* (C), *perceived usefulness of technological tools* (D), and *attitudes towards technology use in general* (A). These findings suggest that enhancing *attitudes towards the use of technology in teaching English* and highlighting the *perceived usefulness of technological tools* are crucial for improving individuals' perceived ability to use these tools. *Attitudes towards technology use to teach English* have the most substantial impact. Although *general attitudes towards technology use* (A) also contribute significantly, their effect is comparatively weaker. Consequently, initiatives aimed

at increasing technological proficiency should focus on specific teaching applications and the practical benefits of technological tools to maximize their effectiveness. Given that attitudes towards using technology to teach English have the most substantial impact on perceived ability, educators should emphasize improving these specific attitudes. This can be achieved by demonstrating how technology enhances teaching effectiveness and provides practical solutions in the classroom. To boost perceived ability, it is essential to exhibit the perceived usefulness of technological tools. Professional development programs should illustrate how these tools can address specific teaching challenges and improve learning outcomes. Training programs should focus on the practical applications of technology in teaching, providing teachers with strategies to effectively use these tools in their specific subject areas. This targeted approach will help increase teachers' perceived ability and confidence in using technology.

CONCLUSION

This study examined the reliability of an adapted instrument and the attitudes of Hungarian English major teacher trainees towards technology use. The proposed data collection instrument was found to be reliable after checking the reliability of the questionnaire items using Cronbach's alpha (RQ1). Dörnyei (2007) highlighted that correlational research using quantitative methods should have a sample size of at least 30 participants. Consequently, the sample size (N=43) was considered appropriate and acceptable for validating the instrument, but insufficient for generalizing the findings to the entire population regarding research questions (RQs 2-4). The results indicated that English major teacher trainees from a Hungarian university hold positive attitudes towards technology use in general, in learning and teaching English, consistent with findings from reviewed empirical articles. These findings highlight that English major teacher trainees perceive technological tools as highly beneficial in their teaching and learning processes. They demonstrate efficient utilization of technological tools and express a willingness to incorporate technology into their teaching practices. Moreover, the results reveal a strong positive relationship between *attitudes towards technology, willingness to use technology,* and *perceived ability to use technological tools*.

Based on the findings, it can be stated that all research questions have been answered. The analysis confirms that the questionnaire used is a reliable tool for measuring Hungarian English major teacher trainees' attitudes towards technology in the EFL classroom (RQ1). Participants generally exhibit positive attitudes towards technology use in this context (RQ2). Regression analysis identifies that the participants' *willingness to use technological tools* (F) can be explained by their *perceived ability to use technological tools* (E), *attitudes towards using technology to learn English* (B), and *attitudes towards using technology to teach English* (C). Among these, *attitudes towards using technology for learning English* are the strongest predictors of *willingness to use technological tools* (RQ3). Additionally, it is revealed that *attitudes towards teaching with technology, the perceived usefulness of these tools, and general attitudes towards technology predict trainees' perceptions of their ability to use technological tools* (RQ4). Thus, the study comprehensively answers the research questions and meets its objectives, providing valuable insights into how attitudes and perceived usefulness influence technology adoption and proficiency among English major teacher trainees.

The study revealed that participants generally hold positive attitudes towards using technology, particularly in learning English. Analysis shows a strong correlation between positive attitudes towards technology use for learning English and the perceived usefulness of technological tools. This robust relationship suggests that enhancing the perceived utility of these tools can significantly improve attitudes towards their use in educational contexts. The findings underscore the importance of focusing on the practical benefits of technology to boost perceptions of its usefulness. To support successful technology integration, it is essential to provide future English teachers with continuous professional development. Training should emphasize effective and creative use of technology, incorporating hands-on sessions and updates on technological advancements. Maintaining and further improving the positive attitudes of Hungarian English major teacher trainees towards technology is crucial, as it will likely enhance both their attitudes and the perceived usefulness of technological tools.

The regression analysis indicates that willingness to use technological tools is strongly influenced by perceived ability, attitudes towards using technology to learn English, and attitudes towards using technology to teach English. Among these, attitudes towards using technology to learn

English have the most significant predictive power. To increase willingness to use these tools, educators should focus on improving attitudes towards technology in learning contexts and enhancing perceived ability. Key findings suggest that positive attitudes towards technology for learning English and its perceived usefulness are crucial for boosting both willingness and ability to use technological tools. Educational institutions should emphasize integrating technology effectively into learning environments and demonstrate its practical benefits. Additionally, professional development should concentrate on the specific applications of technology in teaching to enhance teacher trainees' confidence and competence. This targeted approach will support the overall adoption and effective use of technological tools in education.

There are certain limitations in the study. The relatively small sample size restricts the generalizability of the results. Despite the constraint imposed by the smaller sample size, the instrument demonstrated validity and readiness for application on a larger scale. A larger sample size ($N \geq 250$) would enable more comprehensive statistical analyses, potentially revealing additional correlations and providing a clearer picture of the relationships between variables. The study focuses exclusively on Hungarian English major teacher trainees, which may limit the applicability of the findings to other contexts or educational systems. Therefore, results may not generalize to English major teacher trainees in different countries or regions with varying technological contexts. Additionally, the study relies primarily on quantitative measures. Although the instrument demonstrated validity, incorporating qualitative methods, such as interviews, could offer richer insights into participants' attitudes and perceptions, enhancing the depth of the findings. Given the self-reported nature of the data, there is a risk of response bias, where participants might provide socially desirable answers rather than their true opinions, which could affect the accuracy of the reported attitudes and perceptions. Finally, the study does not compare the attitudes and perceptions of English major teacher trainees with those of other groups, such as non-English majors or teacher trainers from different disciplines, which could provide a broader context for understanding the findings.

Future research directions based on the current findings include several key areas for further exploration. To enhance the generalizability of the data, future studies should consider conducting large-scale quantitative surveys. Additionally, incorporating interviews could provide deeper insights into English major teacher trainees' attitudes towards technology use, offering a more comprehensive understanding and more valid results. As Creswell (2008, p. 28) notes, "Mixed methods researchers look to many approaches for collecting and analysing data rather than subscribing to only one way (e.g., quantitative or qualitative)." Longitudinal studies should be conducted to assess how attitudes and perceived abilities towards technology evolve over time, revealing the impact of sustained interventions on long-term technology adoption and proficiency. Comparative studies across different countries or educational systems could explore variations in attitudes and perceived usefulness of technology, identifying best practices for integration in diverse educational contexts. Since this study focuses on Hungarian English major teacher trainees, future research should also explore the perspectives of both teacher trainees and teacher trainers on technology use in EFL classrooms. Understanding how teacher trainees' attitudes and experiences compare with those of teacher trainers could provide a more comprehensive view of technology integration

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