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An investigation into the relationship between attitudinal and non-attitudinal variables and the utilization of digital technology: the EFL Vietnamese context

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Abstract: This study investigates the relationship between attitudinal and non-attitudinal variables that impact digital technology use by EFL students in Vietnam. An adapted questionnaire was administered to 1,005 students from different tertiary courses. The results showed that students have a positive attitude to the use of technology and sometimes apply digital tools in their language learning. Although there is a low correlation between learners' technology attitude and their usage of applications, other variables like age, English proficiency levels, digital competence, and the major being pursued can predict the usage of technology among students.

Keywords: attitude; confirmatory factor analysis; EFL learners non-attitudinal factors; technology usage

1 Introduction

The proliferation of innovative technologies has facilitated the contribution of information and communications technology (ICT) to education, revolutionizing the education system and equipping students with the necessary skills for the digital era (Albirini 2006; Aydin 2021; Kelly 2018). Technology creates a demand as well as opportunities for students' online learning at all levels of education, including tertiary education (Nguyen and Habók 2023; Niinivaara and Vaattovaara 2018). As these technologies have improved, Higher Education Institutions have

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provided more facilities for students to take part in e-learning, blended learning, or flipped learning and to collaborate and interact with one another on digital platforms while creating additional resources. In short, digital technologies are now indispensable for tertiary institutions all over the world (Hartle 2022; Henderson et al. 2017).

In Vietnam, a developing country in South-East Asia, technology and education are considered a priority for national policy because the quality of a technology-supported education system significantly impacts progress in all national sectors, especially human capital. To better prepare students for future employment, the Vietnam Ministry of Education and Training has devoted considerable attention to English as a foreign language (EFL) courses so that the younger generation can keep pace with globalization. The latest national initiative is the Decision N^o 1400/QĐ-TTg to approve the 10-year national plan for “Teaching and Learning Foreign Language in the National Formal Education System period,” which was issued on September 30, 2008. The project aims to improve English teaching and learning to meet the needs of the globalized world. The policy has established the English proficiency requirements needed for each teaching level based on the Common European Framework for Reference (CEFR). Moreover, grammar-based and teacher-centered pedagogies in English, which followed traditional English teaching methods, have now been mandated to emphasize a more practical orientation so that English classrooms provide authentic experiences for students and create real-life contexts for language usage. One of the elements of this practical orientation is integrating ICT in teaching and learning. However, 10 years after the national plan was introduced, outcomes have not met expectations. The Education First English Proficiency Index for Schools, which is the world’s largest ranking of countries and regions by English skills, reports that Vietnamese students have low proficiency in English (EF Education First 2020), with the country ranking 65th out of the 100 countries taking part in the worldwide language skill survey. The existing literature suggests that students’ attitudes towards ICT integration significantly impact their success in the subject and technology usage (e.g., Yu and Yang 2006) because attitude correlates with students’ interest and motivation. On this basis, the current study examines tertiary Vietnamese students’ attitude towards using technology in their English learning and their utilization of ICT in practice. The research also investigates the relationship between foreign language learners’ attitudes and their usage of technologies in learning and the impact of non-attitudinal factors on the utilization of digital tools. The findings of this study should contribute to the enhancement of ICT in language education, as well as the language proficiency of students in Vietnam.

2 Research background

The relationship between digital tool usage and attitude has received significant attention in the research on integrating technology in education.

2.1 Attitudinal factors

“Attitude” in this context refers to an individual’s feelings about using technology in their learning, a phenomenon that has been investigated in different digital learning contexts (Abolghassem et al. 2013; Lodhi et al. 2019). Attitudes towards digital technologies predict students’ behaviors. The relationship between behavior and attitude has been investigated in different academic contexts over many years. Multiple models have been applied and investigated in these studies, including the theory of reasoned action (Ajzen and Fishbein 1980), which was the scaffold for later models such as the technology acceptance model (Davis et al. 1989), the theory of planned behavior (Ajzen 1991), and other information technology acceptance models. These models have been used and modified in a variety of studies (Tan 2019). Depending on what a specific study was attempting to investigate, attitude scales have been developed as a multidimensional construct. Although attitude covers multiple aspects in different studies, there are three main components: cognitive, affective, and behavioral. The cognitive subscale measures students’ knowledge or perceptions of digital technology in language learning; the affective component examines the feeling or evaluation of the effectiveness of digital applications; and the behavioral component scale reflects the intention or action regarding technology use in learning (Matteson et al. 2016). Although attitude is considered to be latent, it can nonetheless be measured (Bem 1970) by tracking students’ responses to a specific subject and ranking these responses from negative to positive (Fiske 2010).

2.2 Non-attitudinal factors

2.2.1 Age

Age has proved to be a key factor affecting technology usage in learning (Colley and Comber 2003). Research over the past few decades has produced conflicting results on technology use in different age cohorts. Generally, younger students are better at using technology skills (Broady et al. 2010) because they are more involved with digital technology than older people (Czaja et al. 2006). Older people also have to

deal with specific obstacles that limit their technology usage, such as lack of knowledge, cognitive barriers, or inadequate education (Gitlow 2014). Studies find that older people have more difficulty retaining digital skills or take more time to reach higher-level competencies (Dickinson et al. 2005). However, if they become aware of the usefulness or relevance of specific technologies, they are motivated to actively use these applications (Selwyn 2004). Furthermore, a small number of studies reported that age does not significantly affect attitudes towards technology (Staddon 2020), some even noting that older adults had a more positive attitude towards technology than younger cohorts (Eisma et al. 2004) which may lead to frequent usage by older people.

2.2.2 Gender

Gender (biological sex) is one of the non-attitudinal factors that impact technology usage because there is still a gap between men and women in this regard, as shown in a number of studies (Zihui et al. 2017). Most research on technology usage finds that men are represented more than women (Kay 2008; Nguyen and Habók 2021) although the difference is not significant (Teo 2006). More recent studies, however, have found the opposite. For instance, in a study conducted in Saudi Arabia, the men and women had the same participation rates in utilizing digital technologies, despite some restrictions on women using social media (Alothman et al. 2017). Nguyen and Habók (2022) similarly report no significant gender disparity in the utilization of digital technologies in language learning among language learners in Vietnam.

2.2.3 Computer experience

It is not easy to find an agreed definition of “computer experience”. Typically, computer experience is measured by how many years a participant has used a computer or, alternatively, how many hours per week. One of the most cited definitions of computer experience in the literature comes from Jones and Clarke (1995), who focus on three elements: time, opportunity, and range. In recent research, many authors suggest that computer experience is a multidimensional construct that comprises a variety of experience with a wide range of applications (Bozionelos 2001). However, most research defines computer experience by the number of years, and this is the measure applied in this study. The assumption is that students who use computers more often will have higher confidence levels, which then engender a positive attitude and frequent use (Bear et al. 1987). Nevertheless, there are some contexts in which prior computer experience did not predict technology use attitude (Garland and Noyes 2004).

2.2.4 Digital competence level

As with computer experience, digital competency (which encompasses digital literacy, ICT literacy, computer literacy, etc.) may impact technology use because acquiring these skills facilitates usage. Research shows a correlation between students' computer and information proficiency levels and their utilization of digital devices (e.g., Alkan and Meinck 2016).

2.2.5 English proficiency level

Most digital tools are English based. Thus, to effectively apply technology to language learning, students must acquire the basics of the relevant language for the applications. Some studies have found that students' level of English affects technology use (Li and Kirkup 2007) because they have difficulty in understanding the language used in the applications. Therefore, English proficiency level is one of the factors that may predict the usage of technology among students.

Besides these non-attitudinal factors, this study also examines variables such as Internet access, availability of devices (Hakkarainen et al. 2000; Levin and Gordon 1989), and liking of English language as a subject (Rahimi and Yadollahi 2011).

3 Methodology

3.1 Participants and the setting

The online questionnaire was sent to undergraduates from different Vietnamese universities, with 1,005 responses. Among the respondents, 18.5 % were male (186 students) and 81.5 % female (819 students). The average age was 20.1 years. The participants in the study were majoring in various subjects at different universities in Vietnam. None of them had English as their major, but they were all learning English as a foreign language (English is one of the compulsory subjects at Vietnamese universities). In line with the national plan, technology has been integrated in English teaching and learning in all tertiary-level institutions in the country.

Among the participants who filled out the questionnaire, 12.2 % (123 students) had just started using a computer, 28.4 % (285 students), 23.6 % (237 students), 20.6 % (207 students), and 15.2 % (153 students) had used computers between 1 and 3, 3–5, 5–7, and over 7 years, respectively. The students' digital competence was ranked from low to high, with 5.5 % (55 students), 39.6 % (398 students), 30.3 % (305 students), and 24.4 % (245 students) having low digital competence, an

average level, moderately high, and the highest level of digital competence, respectively.

For access to devices, the majority of participants (80.7 %) owned a desktop computer, laptop, or a smartphone (811 students), whereas 19.3 % (194 students) did not have their own devices. Almost all the participants (952 students or 94.7 %) had Internet access at home. As per the national plan, teachers and students were supported with Internet and some digital devices for technology integration in teaching and learning at the universities.

Among the students who participated in the survey, English proficiency levels aligned with the first three CEFR levels: A1 (beginners) at 21.1 % (212 students), A2 (pre-intermediate) at 43.7 % (439 students), and B1 (intermediate) at 35 % (352 students). Only two students (0.2 %) reached the B2 (upper-intermediate).

In addition, more than half of the surveyed participants (555 students or 55.2 %) reported that they had studied English to meet requirements for university graduation. Overall, 13.2 % (133 students) reported that they did not like studying English, whereas 31.6 % (317 students) reported that they liked the subject.

3.2 The instrument and procedure

For the demographic section, the participants were asked to provide information about their gender, age, English proficiency level, their access to devices and Internet, computer usage experience, digital competence level, and feelings about learning English. The questions were adapted from those of the ICT Familiarity for Program for International Student Assessment 2018 (OECD 2017). Apart from the demographic information, the questionnaire also had two other sections: attitudes towards the use of digital tools and utilization of technology in language learning, adapted from the use of the ICT tools questionnaire in Habók and Nagy (2017). The questionnaire was validated for English majors and non-English majors in the Hungarian context (Nagy and Habók 2018). This section had 56 4-point Likert scale items structured in statements. The items were selected, modified, and evaluated based on the target context and language and then translated to Vietnamese.

The technology attitude section included 28 items that ranged from “disagree” to “agree” with eight attitudinal factors. These consisted of four internal factors – affective digital strategies, metacognitive strategies, personal significance of digital technology, and importance of mobile tools. Another four external factors – curriculum-based limitations, task-centered strategies, use of digital tools in learning, and motivating role of digital technology – focused on evaluating language learners’ attitudes towards the use of digital technology in their courses. The technology utilization section had 28 items, including different groups of digital

applications that the students used when learning English (language tools, social media, videos, online learning, task-based tools, and editing and visual tools), ranging from “almost never” to “almost always.” The original questionnaire was a paper-and-pencil version, but the adapted questionnaire was redesigned on Google forms to be delivered electronically to students during their online English classes during the COVID-19 pandemic. The online version of the questionnaire, along with the system functions, was checked by several researchers before it was sent to the students. Before the questionnaire was administered, all the items were tested on 15 undergraduates from the same cohort. On the basis of the feedback from this pilot study, some items were clarified or examples added so that the information was easily understood by the intended participants. After this process was complete, the students were asked to respond to the questionnaire during their online class.

3.3 Research questions

The study addresses the following research questions:

RQ1. What is the reliability and validity of the questionnaire?

RQ2. What are the students’ attitudes and their usage of technology in their language courses?

RQ3. What is the relationship between attitudinal factors and the utilization of technology in language learning?

RQ4. What is the relationship between non-attitudinal factors and students’ use of technology in their language learning?

4 Data analysis and results

RQ1. *What is the reliability and validity of the instrument?*

To address the answer for the first research question, content validity and construct validity were tested to confirm the reliability and validity of the questionnaire.

4.1 Reliability

For the reliability of the questionnaire, Cronbach's alpha (α) was calculated to test the internal consistency of each component. The result indicated that α values for items regarding attitude towards the technology and technology utilization are 0.86 and 0.95, respectively. The α values were >0.70 , indicating that the questionnaire has a reliable internal consistency (Taber 2018).

4.2 Content validity

This was assessed through the content validity index of items (I-CVI) and the scale content validity index – average (S-CVI/Ave). Five experienced researchers from the expert panel were invited to assess the questionnaire items; they were all university academics whose research fields covered the current study. The assessment form was sent to them by email, and the researchers evaluated the questionnaire items based on a 4-point scale, “i.e., not relevant (1), somewhat relevant (2), quite relevant (3), and highly relevant (4). Additionally, the researchers were able to make additional recommendations for revisions of the questionnaire items. Following the recommendations, the items were revised to achieve better content validity. In the current study, the value of I-CVI ranges from 0.85 to 1.00, and the S-CVI/Ave value was 0.85, showing that the questionnaire achieved good content validity (Zamanzadeh et al. 2015).

4.3 Construct validity

A confirmatory factor analysis (CFA) was performed using Amos 22.0 software to evaluate the construct validity of the questionnaire. For this research, the model offered by CFA fitted with the data at an acceptable level. The result of the analysis showed a good fit between the measurement model and the data with comparative fit index = 0.90, root mean square error of approximation = 0.04, and standardized root mean square residual = 0.05 (Hu and Bentler 1999). In addition, a Rasch-model analysis was used to test the fitness of each item in the questionnaire. The result showed that infit items in the questionnaire were within the acceptable range, close to the expected value of 1 with deviance = 93,624.067, $p < 0.01$. The infit and outfit values ranged between 0.70 and 1.30, which is an acceptable fit (OECD 2009). The infit values of the individual items ranked from 0.75 to 1.22, whereas the outfit values ranged from 0.95 to 1.24; hence, the items of the questionnaire were compliant with the research model.

RQ2. *What are the students' ICT attitudes and their usage of technologies in their language courses?*

Overall, the descriptive analysis indicated that students had positive attitudes towards the use of digital tools in their language learning, with an average mean score of 3.18 and $SD = 0.37$. The results indicated that the majority of the undergraduates favored technology usage and were aware of the significance of the integration of digital tools in their language courses. The analysis also found that the students had the most positive attitudes towards task-centered strategies ($M = 3.27$, $SD = 0.61$) and the motivating role of digital tools ($M = 3.26$, $SD = 0.58$). The attitudes of the undergraduates towards the importance of mobile tools, meta-cognitive strategies, and affective digital tool strategies were less positive than those of the two previous items with $M = 3.25$, $SD = 0.55$; $M = 3.23$, $SD = 0.60$; and $M = 3.21$, $SD = 0.38$, respectively. The participants' attitudes towards the personal significance of ICT ($M = 3.18$, $SD = 0.54$), the use of digital tools in learning ($M = 3.03$; $SD = 0.67$), and curriculum-based limitations ($M = 3.02$, $SD = 0.88$) were the least positive compared with that of other factors.

Concerning the utilization of digital tools in students' language courses, the data analysis showed that the undergraduates sometimes used digital tools in their learning with an average mean score of 2.22 and $SD = 0.60$. Comparing frequency of usage between different kinds of digital tools, the trend was for students to learn English through videos, films with English or Vietnamese subtitles, and social media such as Facebook, Hangouts, and smartphone applications more than other tools. Language tools, such as monolingual dictionaries (e.g., the Oxford English Dictionary), bilingual dictionaries (English–Vietnamese), encyclopedias (e.g., Wikipedia), or Internet browsers, and editing and visual tools, such as photo editing, Excel, presentations (e.g., Sway), text editing, or email, are less used. The study found that students did not often use task-based tools such as programming; audio and video chat (e.g., Zoom and Microsoft Teams); simulations; or online learning such as online courses (Massive Open Online Courses), online learning with a native speaker, pronunciation tutorial videos, podcasts, note-taking software (e.g., OneNote and Evernote), or blogs in their language learning. The detailed values for different groups of digital tools are presented in Table 1.

RQ3. *What is the relationship between attitudinal factors and the utilization of technologies in language learning?*

The data analysis showed that overall attitude significantly correlated with the use of digital tools, with a correlation coefficient (r) of 0.21 and a significance level (p) of less than 0.001. The next step investigated the correlation between individual attitudinal

Table 1: The usage of digital tools of the undergraduate.

Digital tools	Number of participants	Mean (<i>M</i>)	SD
1. Language tools	1,005	2.34	0.64
2. Social and media		2.43	0.66
3. Online learning		1.89	0.67
4. Editing and visual tools		2.33	0.73
5. Task-based tools		1.91	0.76
6. Videos		2.43	0.71

factors and the usage of digital tools. Table 2 shows that four attitudinal factors had a significant relationship with the use of technologies of university language students, including internal affective digital strategies ($r = 0.292$, $p < 0.001$), internal meta-cognitive strategies ($r = 0.334$, $p < 0.001$), external curriculum-based limitations ($r = -0.244$, $p < 0.001$), and external use of digital tools in learning ($r = 0.318$, $p < 0.001$). Additionally, the results indicated that internal attitudinal factors significantly correlated with each other ($p < 0.001$). The detailed result is shown in Table 2.

Moreover, a regression analysis found that the four attitudinal components that significantly affected the frequency of using digital tools in language learning had an F value of 41.25, and the significance level (p) was less than 0.001. 22.05 % of technology usage was explained using the regression model ($R^2 = 0.22$). Among the four variables that significantly predicted the use of technology, external use of digital tools in learning at 13.01 % accounted for the highest percentage compared with the other three variables. The result also showed that external attitudinal variables could predict the usage of technology more than the internal attitudinal factors. The detailed values are described in Table 3.

RQ4. *What is the relationship between non-attitudinal variables and students' behavior to the use of technology in language learning?*

This research question was explored through an examination of non-attitudinal factors affecting technology use, with a regression analysis used to check the correlation between non-attitudinal variables and technology usage. The results indicated that the students' age, their English proficiency level, their liking for the subject, and their digital competence levels significantly impacted their technology usage in language learning. These non-attitudinal factors predicted 10.15 % of the utilization of technology among language learners ($R^2 = 0.10$) with an F value of 13.29 and a significance level (p) less than 0.001. Students' English proficiency level

Table 3: Regression analysis of attitudinal variables on the use of digital tools.

Variables	β	Zero order	Sig.	$\beta \times r$ (%)
Internal affective digital strategies	-0.36	-0.84	0.00	3.06
Internal metacognitive strategies	0.40	0.09	0.00	3.73
External curriculum-based limitations	-0.39	-0.05	0.00	2.24
External use of digital tools in learning	0.40	0.31	0.00	13.01
R^2				22.05

Table 4: Regression analysis of non-attitudinal variables on the use of digital tools.

Variables	β	Zero order	Sig.	$\beta \times r$ (%)
Age	-0.155	-0.117	0.00	1.80
English level	0.09	0.32	0.00	3.10
Subject liking	0.21	0.13	0.00	2.92
Digital competence	0.09	0.24	0.00	2.33
R^2				10.15

accounted for the highest proportion (3.10 %), and the values for subject liking, digital competence level, and age were 2.92, 2.33, and 1.80 %, respectively. The details are shown in Table 4.

5 Discussion and conclusions

This study used an adapted questionnaire to explore the correlation between attitudinal and non-attitudinal factors and the use of digital technologies among language learners in the Vietnamese context. The data analysis showed that the instrument was reliable and valid in both content and construct in the educational context of Vietnam society.

In general, the students displayed an awareness of the significance of using digital technology in their language courses. Among the variables in the attitudinal construct, they were most positive towards external task-centered strategies and the motivating role of digital tools. This reveals that the students were positive about their teachers using technology regularly and that the digital atmosphere classroom played an important role in contributing to the positive attitude of learners towards technology. In line with the national plan, the integration of technology into the teaching and learning processes becomes a foremost aspect of education, with Vietnam universities making step-by-step improvements to the facilities to support

teachers and students in the language teaching and learning processes. Furthermore, the curriculum and learning programs are also digitalized to fit the digital era; hence, the data also show that any curriculum-based limitations do not prevent students from applying technology in their learning.

Concerning the different types of digital technology listed in the questionnaire, the students reported that they had learned English from videos or films with subtitles and social media more often compared with other tools. Task-based tools and online learning were not used frequently among learners in their language learning. To help language learners increase their use of these groups of digital tools will require tighter integration with the teaching and learning processes or, alternatively, these tools should be closely linked to language learning. This study's results are similar to the findings with Hungarian language learners reported by Nagy and Habók (2018), who also specified that social media and videos are two of the most common applications that Hungarian students use in their English learning, whereas task-based tools and online learning are utilized infrequently.

Regarding the relationship between attitudinal variables and technology use, a weak correlation was found. The results of the study are consistent with multiple studies in the literature. Among internal and external factors used to examine language learners' attitudes, it was found that both internal and external variables had effects on the learners' attitudes toward the usage of technology, including affective digital strategies, metacognitive strategies, curriculum-based limitations, and the use of digital tools in learning. Thus, to motivate learners to apply technologies in their learning, both internal and external factors must be considered. Additionally, the results also show that the internal factors significantly correlate with one another. Therefore, the first phase of any program should focus on creating a digital environment or adjusting the teaching methodology or revamping the curriculum to make teaching and learning effective. The greater awareness students have of the significance of digital tools, and the more they find them useful, the more positive their attitude is. A study by Mitra and Steffensmeier (2000) suggested that a digitally enriched learning classroom correlates positively with learner attitude. This increases the utilization of technology in their learning, which can motivate the teachers and school stakeholders to promote digital education.

Besides attitudinal variables, non-attitudinal factors also play an important part in technology usage among students. This research explored the contribution of gender, age, English proficiency level, access to devices and Internet, computer usage experience, digital competence level, and language liking to the usage of digital applications. The results show that age, English proficiency level, digital competence, and liking learning English significantly affect technology usage, with the students' English level accounting for the highest percentage. The results are in line with several previous studies that also found that the English proficiency level of students

may affect their technology attitude (Antonio and Tuffley 2014) and, later on, their technology usage (Li and Kirkup 2007) because of the language barriers when accessing digital applications or programs. A small number of previous studies found that age is one of the factors that predict the use of technology (Selwyn 2004), suggesting that younger students use more technology for their courses than older ones. The current research also finds that age can predict the usage of digital applications among university students, although this is the least impactful factor predicting usage of digital tools compared with other non-attitudinal variables. Furthermore, digital competence level also affects digital usage among language learners because the confidence of students in using technology can motivate them to use more digital tools in their language courses (Alkan and Meinck 2016). The literature also proposes that liking English courses can contribute to the integration of digital technology in teaching and learning language (e.g. Rahimi and Yadollahi 2011), which is supported in this study. Thus, if learners are interested in learning English and technology makes their learning more effective, they should be more motivated in applying language digital tools to improve their language proficiency. These findings may imply that teachers and school stakeholders should provide language learners with opportunities to learn the basic relevant language used in target digital applications so that language barriers do not become an issue that prevents students using technology in their courses. In addition, teachers can provide learners more opportunities to apply technology to the teaching and learning processes because the more frequently learners use digital technology, the more confident they feel when interacting with new applications. Moreover, technology integration in language learning should be consistent with students' tasks and should support them in improving their basic skills for the 21st century, such as problem solving, creativity, and collaboration (Partnership for 21st Century Learning 2015). Furthermore, reasons should be given for the applications of technology usage (Ng 2012) because young people tend to use technology mostly for communication and entertainment rather than educational purposes.

In this study, the ownership of digital devices such as smartphones or laptops and access to the Internet has no significant relation with information and communication technology usage. The study does not support previous research that claimed that access to digital tools creates a "digital divide" between students (Becker 2000) or that the ownership of devices is associated with the positive attitudes towards integration of technology (Smith et al. 2000). Additionally, no gender differences in using applications were found in this study. In a study by North and Noyes (2002), the authors found no disparity in gender in using technology, which may be a result of the improvement of technology integration in schools. In the Vietnamese context, the guidelines of the national plan have been followed for over a decade in integrating technology in language teaching and learning, with both male and female

students equally supported for learning in a digital environment, and technology integration improved in both facilities and education (Peeraer and Van Petegem 2015). It is also interesting that, in the context of Vietnam tertiary institutions, language learners' computer experience does not have a notable correlation with usage. The findings of the study are not compatible with Hasan (2003), who proposed that computer experience is strongly affected with self-efficacy belief that motivates learners to apply technology in their learning due to the learners' belief of their capability in performing a task. The current study may be explained by the fact that students in the digital society are "digital natives" who are tech savvy and grasp the technology trend quickly. Thus, inexperience or experience do not create a large gap among students in using technology.

6 Limitation of the study

The study was conducted in some universities in Vietnam, a developing country; hence, the results cannot be generalized with other educational contexts. In addition, the study used a self-reported instrument to investigate the relationship between attitudinal and non-attitudinal factors affecting students' use of technology in their courses. Furthermore, at the time this study was conducted, artificial intelligence (AI) was not widely discussed, and the study did not examine the potentially significant impact that AI may have on perceptions related to the adoption of digital technology in the future. Subsequent studies can delve into attitudes and the utilization of innovative AI technologies in language education.

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