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Digital Literacy of EFL Students: An Empirical Study in Vietnamese Universities

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Abstract: The current research investigates the digital literacy levels of 1661 English as a foreign language (EFL) learner at Vietnamese universities. We used an adapted questionnaire to assess students' digital knowledge and their perceived skills, their attitudes toward the use of digital technologies, and the frequency of use of technology applications in English learning. The findings reveal that most Vietnamese students can access digital technologies at home and in their institutions. Furthermore, students achieve an adequate level of knowledge regarding digital literacy, and their technological skills range from low to average. Students' attitudes toward technologies are positive, but they do not use technologies extensively when learning English. Comparisons show that males have better digital knowledge and skills than their female peers. Although female students are more aware of the digital integration benefits of learning than their male peers, males tend to use technologies more extensively than females. There are also discrepancies among different year groups. Seniors have the best digital knowledge, while freshmen possess the highest technical skill levels. Junior and senior students' attitudes toward technology applications in English learning are more positive than those of freshmen and sophomores.

Keywords: digital competence, digital literacy, gender differences, ICT competency, language learners

1 Introduction

The development of information and communication technologies (ICT) has enriched all professions, including education. New digital trends have encouraged schools and educational systems to integrate ICT in teaching and learning. Indeed, there are many benefits to digital learning environments (Soroya and Ameen 2020). Several previous studies have proved that integrating ICT in education not only benefits teachers in the classroom, but it has positive effects on students' learning (Arrosagaray et al. 2019; Bai et al. 2016; De Witte and Rogge 2014; Inan and Lowther 2010; Lai et al. 2015). Additionally, many studies have examined factors affecting ICT integration among teachers and students (Aesaert et al. 2015; Drent and Meelissen 2008; Habibi, Yusop, and Razak 2020; Ifinedo, Rikala, and Hämäläinen 2020; Magyar et al. 2020; Nadeem et al. 2011; Teo 2011; Vitanova et al. 2015). Among the factors under investigation, one of them relating to teachers and students is how their ICT competency affects their ICT integration in the teaching and learning process (Aslan and Zhu 2016). To successfully integrate ICT in education, school administrators need to understand teachers' and students' ICT competency levels to deliver suitable policies and training courses to support education in schools.

ICT competency is an umbrella term that has been conceptualized by many authors in different studies, and it is not an easy term to define. Based on specific contexts, each author has a way of specifying ICT competency. In general, ICT competency includes knowledge, skills, and attitude (Pernia 2008). ICT knowledge refers to the relevant content or the advantages of ICT that an individual realizes when applying it in different fields. ICT skills refer to the ability to apply ICT to obtain different goals. Attitude means understanding the value of ICT integration and the critical observations that an individual makes from experience. ICT competency covers many fields in the realm of technology, such as ICT literacy, digital literacy, information literacy, computer literacy, technology literacy, and advanced and professional skills (Tristán-López and Ylizaliturri-Salcedo 2014). These terms are sometimes interchangeable, and the boundaries between them are not clear-cut. Different researchers choose an area of focus in their studies or narrow down the field to fit their context (Scherer and Siddiq 2019; Smith and Matteson 2018; Zinn, Stilwell, and Hoskins 2016). The current study focuses on digital literacy (DL), and the research aims to assess DL of English as a foreign language (EFL) university learners.

In the Vietnamese context, the Ministry of Education and Training has recognized the effects of digital

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technologies on education, particularly English teaching and learning. It has put a lot of effort into reforming education through the implementation of technology at all levels of education since technology can create huge changes in teaching and learning methods. Likewise, technology will affect education management, and integrating technology into schools will positively affect the quality of education and the development of the country (Peeraer, Thy, and Ha 2009). Despite this national emphasis on technology integration, some challenges affect the speed of integration in teaching and learning, including students' DL (Dashtestani and Hojatpanah 2020). The report on the status of ICT integration in education in Southeast Asian countries in 2010 listed a four-stage model of UNESCO ICT development including (1) emerging, which means becoming conscious of ICT, (2) applying, which refers to learning how to use ICT, (3) infusing, which involves firmly grasping how and when to use ICT, and (4) transforming, which comprises specializing in the use of ICT. According to the report, Vietnam is in the third stage of its National ICT in Education Vision and the fourth stage in Education Plans & Policies, Complementary National ICT & Education Policies, ICT Infrastructure & Resources in Schools, and Teaching & Learning Pedagogies (SEAMEO [Southeast Asian Ministers of Education Organization] 2010). However, some previous studies reported that using ICT applications in English teaching and learning in Vietnam is limited (Peeraer and Van Petegem 2011). Unfortunately, few studies focus on measuring the levels of students' DL. Meanwhile, students' attitudes are fundamental aspects in the successful integration of new technology in education (Rogers 2000) and DL is known to significantly affect the application of digital technologies in the EFL context (Alavi, Borzabadi, and Dashtestani 2016). Consequently, this study aims to examine students' DL, and the results of the research should provide implications regarding the direction of ICT integration in English education.

2 Background

2.1 Definitions of DL

In general, there are two types of DL definitions: the conceptual definition and a definition related to sets of operations (Lankshear and Knobel 2006). DL's conceptual definition, introduced in 1997, is generally explained as "the ability to properly use and evaluate digital resources, tools, and services, and apply it to lifelong learning processes" (Gilster 1997, 220). In Gilster's definition, the author did not list the necessary competencies for DL; however, DL's scope has been developed gradually. Different skills have been added to extend the boundaries of the original definition. There are overlaps among the perceptions, and the exact definition of DL is contentious (Ferrari 2013). Different authors and practitioners have proposed various definitions since technologies influence the concept. Furthermore, the definition is broader than the capability of applying technologies—it is a particular type of mindset (Eshet 2002). Eshet-Alkalai (2004, 102) proposed that DL was a "survival skill in the digital era" and that it is mainly applied in formal education. The author also thought that DL was based on the integration of multiple literacies, including photo-visual literacy, reproduction literacy, information literacy, branching literacy, and social-emotional literacy. Similarly, Martin and Madigan (2006) define DL as the competence of successfully encountering with electronic infrastructure and devices that empower the digital century. However, they extend DL's scope by relating it to other areas such as ICT literacy, information literacy, media literacy, and visual literacy. Erstad (2006) added attitudes to the definition of DL when referring to the skills, knowledge, and attitudes in technology adoption to overcome learning challenges. With the sheer growth of digital technologies and new media, Ng (2012) describes DL as the variety of literacies accompanied with the technology transfer and utilization. The author added modern technologies, including hardware and software, to clarify and extend the definition of terms such as desktops, mobiles, interactive whiteboards, Web 2.0 technologies, and other online resources.

Another group of authors focuses on operations when describing the specificities of DL. DL is a set of ICT skills and tool usage for retrieving, assessing, storing, generating, conveying, and transferring information and connecting and engaging in collaborative networks (Ferrari 2013). Son (2015, par. 1) emphasizes the reasons for DL. He claims that it is "the ability to use digital technologies at an adequate level for creation, communication, collaboration, and information search and evaluation in a digital society" for specific purposes. Similarly, Roche (2017) highlights DL as the ability to evaluate, utilize, and generate information by means of digital media and to engage with individuals and the society. Law et al. (2018) also divided DL into different levels of operations such as accessing, managing, understanding, integrating, communicating, evaluating, and creating safe and appropriate information via technology securely and suitably for different purposes in different fields. The authors also talk about DL when referring to other ICT competency areas like computer literacy, ICT literacy, information literacy, and media

literacy. Although the definitions vary and the scope of the concept has been extended gradually due to the expansion of digital technologies, the main point of DL is to summarize, synthesize, and integrate information from varied sources (Gardner 2006). By connecting the above definitions, DL can be understood as the knowledge, skills, and attitude needed when handling technological devices to create, communicate, collaborate, search, and evaluate the information for specific purposes in the digital era.

2.2 DL and Digital Competence

Digital competence (DC) has been used since the launch of the Digital Competence Framework (DigComp), as explained in Ferrari (2013). Although DL and DC are often synonymous, two terminologies have different origins and meanings (Iordache, Mariën, and Baelden 2017; Martin and Grudziecki 2006). The differences between DL and DC have been discussed in the literature since the two concepts are used in different ways, and authors and practitioners have diverse ideas. DL is considered a necessary skill to achieve DC (Ferrari 2013). DC is considered one of the eight key competencies for lifelong learning, together with literacy competence; multilingual competence; mathematical competence and competence in science, technology, and engineering; personal, social and learning to learn competence; citizenship competence; entrepreneurship competence; and cultural awareness and expression competence (European Commission 2018). Martin and Grudziecki (2006) expressed different ideas when they proposed three levels or stages for DL development with DC, digital usage, and digital transformation. According to the authors, DC is one component of DL, or DL underpins DC since DC is the first step to an individual achieving DL. For the current study, the authors will not discriminate between the two terms' meaning or origins; hence, DL will be used instead of DC, and DL and DC are synonymous in the research.

2.3 Dimensions/Components and Assessments of Digital Literacy

DL is a "multidimensional construct in assessment" (Jin et al. 2020). At the global level, DigComp was developed by the European Commission to improve the progress of education in Europe (Ferrari 2013); however, the framework could be applied in different contexts. The framework depicts the knowledge, skills, and attitudes of DC in five fields, including (1) information and data literacy, (2) communication and collaboration, (3) digital content creation, (4) safety, and (5) problem-solving. Another well-known framework, which was developed by The International Computer and Information Literacy Study (ICILS) to assess DL, is comprised of eight aspects in four strands: (1) understanding computer use, (2) gathering information, (3) producing information, and (4) digital communication (Fraillon et al. 2019). Furthermore, other frameworks have been developed to assess DL that are like ICILS or DigComp, such as the one developed by the OECD (2012) in the project for the International Assessment of Adult Competencies or the framework approved by the Assessment and Teaching of 21st Century Skills (ATC21S) program (Wilson, Gochyyev, and Scalise 2017). However, these frameworks' scopes are narrower, and DL assessment is not the only focal point.

The frameworks were applied to assess DL in different empirical studies; nevertheless, several authors considered DL to be a unidimensional construct (Jin et al. 2020). As a result, different authors have developed dimensions, components, and elements of DL in specific contexts. When Gilster introduced DL in 1997, the author also mentioned components such as knowledge assembly, analyzing and assessing information content, searching the Internet, and navigating hypertext. Krumsvik (2008) developed a model for DL with four basic subscales, including (1) basic ICT skills, (2) didactic ICT competence, (3) learning strategies, and (4) "digital Bildung" (the intersection between the first three factors). In the same year, Bawden listed underpinnings, background knowledge, central competencies, and attitudes and perspectives as components of DL (Bawden 2008). Hague and Payton (2010) included other aspects in DL: online safety, effective communication, information search and selection, collaboration, understanding the diversity of culture and society, critical reasoning and assessment, and creativity. JISC (2014) developed a DL model with seven elements, including media literacy, information literacy, communications and collaboration, digital scholarship, career and identity management, learning skills, and ICT literacy. Son (2015) considered that the ability of searching and evaluating information, creating, communicating, collaborating, and e-safety are also DL elements. The author also developed tools to assess the DL of language teachers and learners in an EFL context, and these five elements are reflected in the questionnaire. The current study has adopted Son's five elements to assess language learners' DL.

2.4 Related Research

Several previous studies investigated students' DL. Dashtestani and Hojatpanah (2020) researched the DL levels of

Iranian students. The questionnaire results depicted that students' DL is low, and they do not apply a broad range of computer applications and software. The study also indicates that the low DL level results from the Ministry of Education's ill-defined plans as regards improving students' levels of DL. Son, Park, and Park (2017) compared the DL of undergraduates learning English for academic purposes (EAP) and EFL in two universities in Canada and Japan. The study reported that all EAP participants taking part in the study were aware of digital technologies and were familiar with using them. In addition, most EAP students indicated that their level of DL was good or very good, while most EFL participants self-assessed their DL level as acceptable or good. Cote and Milliner (2017) surveyed first-year college students preparing for their study abroad program to find out students' specific DL levels. The results indicated that almost all students in the sample thought they had limited DL and lacked the necessary experience and skills. Mabayoje et al. (2015) explored the low DL level among rural Nigerian students. Most respondents had computer teachers and that they could operate computers. However, the lack of ICT facilities is a reason for the low DL levels among students.

Moreover, Danner and Pessu (2013) carried out a study to investigate issues among Nigerian students in Teacher Preparation Programs at the university level. The study concluded that ICT use among students was low, especially regarding using email and the Internet. The participants assessed themselves as good at word processing and file navigation, but moderate regarding Internet browsing and email. While 2% of participants thought they were proficient in using PowerPoint, 70% said they were not good at using the application. Ng (2012) measured the DL of university sophomores, and the findings indicated that students' DL levels enabled them to use unfamiliar digital tools in educational settings. Furthermore, the study also claimed that students' DL levels could be improved through explicit teaching and learning regarding ICT integrations. Kubiatko (2007) found that students' DL levels were improving, and students mainly used the Internet for information search. Furthermore, the author found that more students used the Internet at school than at home. The reason for this finding is that the cost of using the Internet in Slovakia is not cheap.

Previous studies have not focused much on comparing the DL of students in different grades; therefore, few studies differentiate between the DL of students or evaluate the enhancement due to DL in different age cohorts. Lazonder et al. (2020) carried out a study to explore students' DL skill improvements. The research results show that children increased their skills over three years of study, and the development of students' DL is related to sociodemographic factors. Kim, Ahn, and Kim (2019) conducted research to assess Korean primary and secondary school students' DL and found that students' DL had progressed. Gender and DL have also been researched in numerous studies over the years. Some recent research reported that males tend to have higher DL than females (Alakpodia 2014; Albirini 2006; Calvani et al. 2012; Deursen 2012; Gui and Argentin 2011; Siddiq and Scherer 2019). However, numerous papers have found that female students have higher DL than their male peers (Fraillon et al. 2014; Hatlevik, Ottestad, and Throndsen 2015; Kim, Kil, and Shin 2014; Milner et al. 2013). In other contexts, some studies have found no discrepancy in DL between the two genders (e.g., Danner and Pessu 2013; Hargittai and Shafer 2006).

3 Research Questions

This article aims to investigate the level of DL of Vietnamese university students who are learning English. The study's main objectives were addressed in the following specific guided questions:

(1) To what extent do students use digital tools when learning English?
(2) Is there any discrepancy between male and female university students concerning DL?
(3) Is there any difference between freshmen, sophomores, juniors, and seniors regarding DL?

4 Methods

4.1 Sample for the Study

The study randomly selected 1,661 Vietnamese university students (73.2% female and 26.8% male) from 10 universities in Hanoi, Ho Chi Minh City, and Kien Giang province (Vietnam). The participants ranged in age from 18 to 22. Of the 1,661 university students who responded to the questionnaire, 7.7% were freshmen, 22.2% were sophomores, 15.5% were juniors, and 54.6% were seniors (Table 1). Participants come from different majors like Linguistics, English education, Math Education, and Business.

4.2 Instrument Development

The instrument was developed according to the theoretical background and the research issues regarding DL (Son, Park and Park 2017; UNESCO 2018) and attitudes toward

Table 1: Sample for the study.

	Females (N = 1217)		Males (N = 445)	
	Number (N)	Percentage (%)	Number (N)	Percentage (%)
Freshmen (N = 128)	101	78.9	27	21.1
Sophomores (N = 369)	277	75.1	92	24.9
Juniors (N = 258)	204	79.1	54	20.9
Seniors (N = 906)	634	70	272	30

using ICT tools in educational and EFL contexts (Habók and Nagy 2017; Nagy and Habók 2018). The questionnaire items were adapted, translated into Vietnamese, reviewed, revised, and edited by teachers and researchers several times. The instrument that was used in the research contained five main parts: background information, general digital knowledge test, technological skills, attitudes toward technology integration in English learning, and frequency of using digital tools in English learning. In the first section, background information, students were asked to answer questions regarding their gender, school year, English learning experience, digital technology use, and the availability of digital facilities at home and in school. The second part, the general digital knowledge test, asked multiple-choice questions to investigate data about students' digital knowledge. The third part, technological skills, includes 4-point Likert-scale questions with responses from "no level of competence" to "high level of competence" as well as "Yes/No questions" to elicit data about students' skills. In the last two sessions, 4-point Likert-scale questions with responses from "agree" to "disagree" as well as from "almost never" to "almost always" are used to explore students' attitudes toward using digital technologies and the frequency of using digital tools in English learning. Exploratory factor analysis indicated that the instrument had a suitable factorial structure to confirm the questionnaire's construct validity. The Kaiser-Meyer-Olkin measure of sampling adequacy was used for all sections except for the background information section (Section 2 = 0.96, Section 3 = 0.93, Section 4 = 0.89, Section 5 = 0.95). Bartlett's test of sphericity was also used (p = 0.00). Cronbach's Alpha coefficients rank from 0.87 to 0.95, implying a good level of reliability for the questionnaire fields (Taber 2018).

4.3 Procedure

The survey was administered to students on paper, as well as Google forms, from mid-August to mid-October 2020. Students who volunteered to complete the questionnaire understood the study's purpose before they filled in the form. In total, 767 answers were collected on paper, and 894 replies came from Google forms.

4.4 Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences version 22. The t-tests and one-way variance of analysis (ANOVA) were performed to explore the discrepancies in DL between males and females and among year groups of students.

5 Results

5.1 Students' Digital Familiarity and Experiences in Learning English

We will take a closer look at the descriptions of the participants who volunteered to complete the questionnaire (Figure 1). Of the 1661 respondents who were asked whether they have access to a computer at home, 1331 (80%) stated that they own and use computers at home, while 6.9% do not use the computers at home. However, they can access a computer, and 217 (13.1%) cannot access a computer at home since they do not own personal computers. When asked if they were able to access the Internet at home, 1588 (95.6%) participants replied that the Internet is available at their home, while 1.7% can access the Internet, but they do not use it, and 2.7% do not have the Internet available at their home. When asked whether they can connect to the Internet at school, 1263 (76%) out of 1661 students reported that they do have an Internet connection while studying at school. The percentage is smaller than the percentage of students whose Internet is available at home (95.6%). A total of 146 (8.8%) students can connect to the Internet at school, but they do not use it, while 252 (15.2%) survey respondents have no Internet connection at school. A total of 76.3% of participants have used their phones to learn English, while 12% of students stated that they have English learning applications on their phone, but they do not use them. Further, 11.7% of respondents do not use phones to learn English. Compared to the percentage of participants learning English on their phone, the percentage of students utilizing computers to learn English is slightly smaller: 1120 (67.4%). In total, 216 (13%) respondents learn English on the computer, while 325 (19.6%) students do not learn English on computers. In particular, it has been revealed that students are equipped

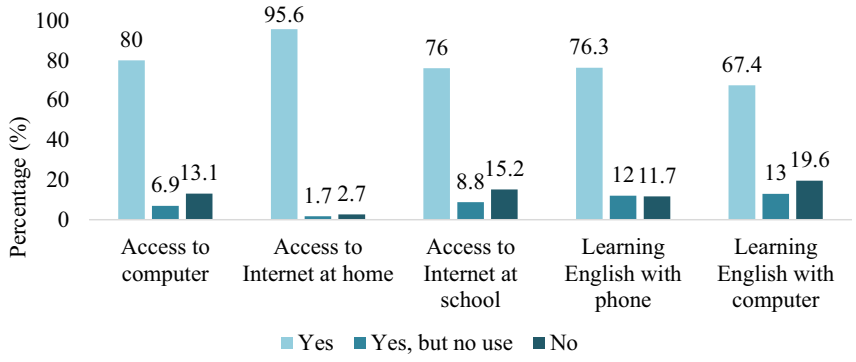

Figure 1: Access to Internet and technological devices (%).

with necessary supplies, which facilitate them in learning English with technology.

The informants were asked to indicate the computer experience they have had until now when filling in the questionnaire (Figure 2). A total of 211 (12.7%) students have no experience or less than one year of experience of using a computer. In comparison, 474 (28.5%) respondents have used a computer for one to three years, and 384 (23.1%) participants have three to five years' experience of using a computer. The number of students who started to use a computer five to seven years ago is 339 (20.4%) and 253 (15.2%) students have more than seven years' experience of using computers. In general, almost all students have been accustomed to using computer in the learning process, and their experiences may have positive effects on their ICT integration in learning.

The participants were also asked about their experience with English learning (Figure 3). While 215 (12.9%) students stated that they had learned English from a few days to two years, 194 (11.7%) students have three to five years of English learning experience. A total of 287 (17.3%) students have learned English for six to eight years; 434 (26.1%) students have learned English for nine to 11 years; 531 (32%) students have more than 12 years of English learning experience. The majority of the participants are reported to have considerable experience in language learning.

5.2 Gender Differences in Digital Literacy

To address the second research question about the difference between male and female university students concerning DL, we used *t*-tests to compare their DL knowledge, technological skills, attitudes toward digital applications when learning English, and the frequency of digital tool usage in English learning.

The DL knowledge test results show that the females' mean is 0.80 (SD = 1.03) while that of their male peers is

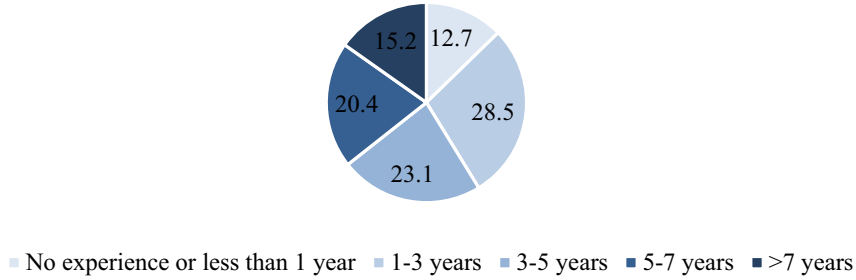

Figure 2: Experience with computers (%).

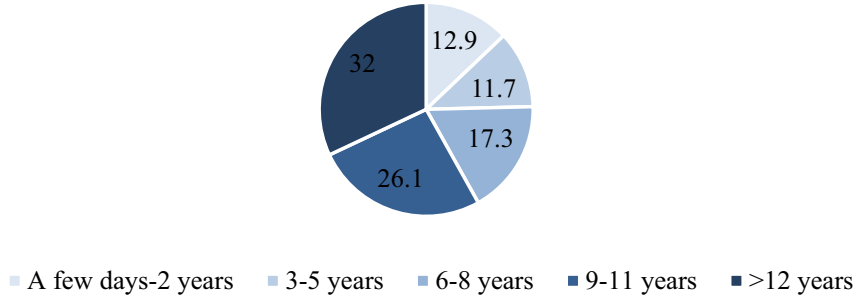

Figure 3: Experience with English (%).

0.82 (SD = 1.23), t = 2.64, and p = 0.01. This indicates a significant difference between males and females in terms of digital knowledge ($p < 0.05$), and that male students have a better knowledge of DL than female students.

Table 2 shows the findings of students' perceived assessment of technical skills in terms of mean and standard deviation. The mean range of 1–2.5 illustrates no level or a low level, 2.6–3.5 an average level, and 3.6–5 a moderately high to a high level. In general, the average of all male students' skills is slightly higher than that of the female students (M_{male} = 3.47, SD = 0.65, M_{female} = 3.42, and SD = 0.55). Male students see themselves as having higher skills as compared to the responses from the females. The findings show that male students have a higher level of skills than their female peers in typing skills, computer skills, and digital skills, while female participants' Internet skills are better than their male peers. Additionally, while there is no significant difference between males and females as regards levels of typing skills and Internet skills ($p > 0.05$), while computer skills and digital skills are significantly different between the two genders ($p < 0.05$). In terms of web search skills, both genders are at the same level (M = 3.63).

Table 3 shows the results of self-rating skills for using computer and Internet applications. In general, students have a low level or no level in terms of learning management systems, virtual worlds, web design, podcasts, wikis, and blog applications. Although students' levels are low, male students reported having better skills than females, except for blogs. About word processing applications, spreadsheets, databases, presentation, communication, file sharing sites, photo sharing sites, and dictionaries, all students are at an average level. Female students' word processing, spreadsheets, presentations, and dictionary application skills are slightly higher than their male counterparts. However, males' skills are significantly better than their peers in terms of file sharing sites, photo sharing sites, and video sharing sites. Both genders are equal in terms of databases and communication applications. The respondents also reported that they have moderately high to high skill levels with social networking services and web search engines. Male students assess themselves as having higher skills than females; however, there is no significant difference between them ($p > 0.05$).

The results of students' self-reported specific tasks show that students are able to deal with computing tasks well since the mean for these abilities are highest (M_{male} = 0.96, SD = 0.23; M_{female} = 0.94, SD = 0.20; t = 2.06, and p = 0.17) while students' skills as regards web design are not good (M_{male} = 0.47, SD = 0.49; M_{female} = 0.50,

Table 2: Males' and Females' self-assessment of technological skills.

Skills	Gender	Mean (M)	SD	*t*	*p*
Typing skills	Male	3.42	0.78	0.79	0.46
	Female	3.39	0.69		
Web search skills	Male	3.63	0.71	0.03	0.96
	Female	3.63	0.66		
Computer skills (the capability to use a computer)	Male	3.51	0.77	2.35	0.01
	Female	3.41	0.68		
Internet skills (the capability to use the Internet)	Male	3.73	0.77	−1.46	0.14
	Female	3.80	0.69		
Digital skills (the capability to use digital technologies)	Male	3.08	0.87	3.41	0.01
	Female	2.92	0.82		
Average	Male	3.47	0.65	1.34	0.15
	Female	3.42	0.55		

Table 3: Males' and Females' self-ratings of skills for using computer and Internet applications.

Applications	Gender	Mean (M)	SD	*t*	*p*
Word processing	Male	3.31	0.78	−0.10	0.82
	Female	3.32	0.70		
Spreadsheets	Male	3.10	0.81	−0.22	0.79
	Female	3.11	0.72		
Databases	Male	3.47	0.86	−0.18	0.94
	Female	3.47	0.78		
Presentations	Male	3.18	0.82	−0.98	0.28
	Female	3.23	0.77		
Communication	Male	3.22	0.82	−0.19	0.94
	Female	3.22	0.80		
Learning management systems	Male	2.41	1.05	0.88	0.42
	Female	2.37	1.04		
Virtual worlds	Male	2.31	1.13	2.40	0.01
	Female	2.16	1.06		
Social networking services	Male	3.84	0.88	−1.07	0.35
	Female	3.88	0.84		
Blogs	Male	2.46	1.06	−0.42	0.92
	Female	2.46	1.08		
Wikis	Male	2.57	1.09	2.15	0.02
	Female	2.43	1.12		
Podcasts	Male	2.29	1.09	1.73	0.05
	Female	2.18	1.10		
File sharing sites	Male	3.33	0.92	2.78	0.00
	Female	3.18	0.91		
Photo sharing sites	Male	3.18	1.05	1.82	0.03
	Female	3.05	0.99		
Video sharing sites	Male	3.56	0.92	3.78	0.00
	Female	3.35	0.92		
Web design	Male	2.28	1.14	1.66	0.07
	Female	2.17	1.11		
Web search engines	Male	3.61	0.93	1.62	0.09
	Female	3.52	0.93		
Dictionaries	Male	3.15	0.99	−4.04	0.00
	Female	3.37	0.96		

SD = 0.50; $t = -1.42$, $p = 0.23$). In general, the results also indicate that males are better than females in terms of these specific tasks.

Differences between males and females regarding attitudes to the use of digital tools are examined concerning the eight factors identified in the previous study with four internal factors and four external factors (Nagy and Habók 2018) including effective digital strategies, metacognitive strategies, the personal significance of digital tools, the importance of mobile tools, curriculum-based limitations, task-centered strategies, use of digital tools in learning, and the motivating role of technologies. As shown in Table 4, both male and female students have positive attitudes toward using digital technologies. However, girls' positive attitudes toward the use of digital tools are stronger than boys, and the differences are significant regarding metacognitive strategies and the personal significance of digital tools ($M_{male} = 3.12$, SD = 0.60; $M_{female} = 3.20$, SD = 0.60; $p < 0.05$).

The frequency of digital technology use between the two groups of students is revealed in the last section of the survey (Table 5). Students were asked to report their frequency of using technological tools for learning English, and the findings were described regarding the means. In general, students' frequency of using technologies in English learning is not high. The collected data show that students use social and media tools (e.g., Facebook, Skype, Hangouts, etc.), search engines and browsing, as well as translation tools (e.g., Google Translate, films with Vietnamese subtitles, etc.) more extensively than other types of tools. In contrast, students less frequently use podcasts, task-based tools (e.g., programming, simulations, etc.), or online learning (e.g., online courses, online learning with a native speaker, etc.). Although males tend to use digital tools more frequently than females, the difference between the two groups of students is not significant, except for the frequency of using task-based tools ($M_{male} = 1.92$, SD = 0.68; $M_{female} = 1.82$, SD = 0.70; $p = 0.01$) and online learning ($M_{male} = 1.87$, SD = 0.62; $M_{female} = 1.80$, SD = 0.63; $p = 0.05$). This finding is interesting since females have more positive attitudes toward using digital technologies than males, while the latter use technologies more frequently.

5.3 Year Group Discrepancies in Digital Literacy

ANOVA analyzed the disparity among freshmen, sophomores, juniors, and seniors' knowledge of DL. It seems that seniors and sophomores have a better knowledge of technologies than freshmen and juniors, and seniors have the best knowledge of DL compared to other groups (Table 6). Furthermore, a *post hoc* test also revealed significant differences between freshmen and seniors and seniors and juniors ($p < 0.05$).

Table 4: Males' and Females' attitudes toward the use of technologies.

Attitude	Gender	Mean (M)	SD	*t*	*p*
Affective digital strategies	Male	3.21	0.45	−1.69	0.08
	Female	3.25	0.43		
Metacognitive strategies	Male	3.12	0.60	−2.19	0.02
	Female	3.20	0.60		
Personal significance of digital tools	Male	3.07	0.53	−4.07	0.00
	Female	3.19	0.53		
Importance of mobile tools	Male	3.24	0.59	−0.68	0.58
	Female	3.26	0.56		
Curriculum-based limitations	Male	2.94	0.82	−1.19	0.23
	Female	2.99	0.85		
Task-centered strategies	Male	3.25	0.63	−1.61	0.10
	Female	3.31	0.63		
Use of digital tools in learning	Male	2.96	0.65	0.76	0.44
	Female	2.93	0.65		
Motivating role of technologies	Male	3.27	0.55	−1.73	0.08
	Female	3.32	0.55		

Table 5: Males' and Females' frequency of use of digital tools.

Tools	Gender	Mean (M)	SD	*t*	*p*
Social and media tools	Male	2.92	0.81	−1.88	0.40
	Female	2.96	0.78		
Task-based tools	Male	1.92	0.68	2.56	0.01
	Female	1.82	0.70		
Search engines and browsing	Male	3.02	0.88	1.07	0.43
	Female	2.96	0.88		
Podcasts	Male	1.72	0.86	1.34	0.20
	Female	1.66	0.83		
Dictionaries and lexicons	Male	2.52	0.67	−1.76	0.06
	Female	2.59	0.68		
Online learning	Male	1.87	0.62	1.96	0.05
	Female	1.80	0.63		
Editing and visual representation of information	Male	2.40	0.74	0.53	0.84
	Female	2.38	0.74		
Communication tools	Male	2.70	0.77	1.64	0.10
	Female	2.63	0.80		
Videos	Male	2.26	0.68	1.35	0.21
	Female	2.20	0.68		
Translation tools	Male	2.99	0.79	0.58	0.78
	Female	2.97	0.75		

Table 6: Year groups of students' DL Knowledge test.

	Groups	Mean (M)	SD	Mean square	*F*	*p*
DL knowledge test	Freshmen	0.77	0.75	0.170	7.053	0.00
	Sophomores	0.80	0.45			
	Juniors	0.77	0.83			
	Seniors	0.82	1.25			

Table 7 shows the discrepancies among year groups of students regarding technological skills. In general terms, freshmen's perceived skills are the highest (M = 3.61, SD = 0.66), while seniors' skills are the lowest (M = 3.38, SD = 0.57) among year groups of students. A p*ost hoc* test indicated a significant difference between freshmen and seniors, sophomores and seniors, as well as juniors and seniors concerning typing skills and digital skills ($p < 0.05$). Simultaneously, there is no remarkable divergence among the three first groups ($p > 0.05$). In addition, web search skills, computer skills, and Internet skills among student groups are not significantly different.

The results of the self-rating skills for using computer and Internet applications are also specified. In terms of word processing, spreadsheets, databases, communication, wikis, video sharing sites, and dictionary tools, the most proficient students are the freshmen, and the level gradually reduces with sophomores, juniors, and seniors. The order among year groups of students changes for presentation, learning management systems, virtual worlds, blogs, podcasts, photo sharing sites, and web design. While the freshmen are still the most skillful and seniors are the least proficient, the *post hoc* test showed that the juniors' levels are higher than those of sophomores, though the differences are not significant ($p > 0.05$). Concerning the skills relating to using social networking services, file sharing sites, and web search engines, freshmen maintain the highest level. Seniors are more proficient than their junior peers or sophomore peers with social networking services, web search engines, and file sharing sites.

Students' self-reported tasks in different year groups indicated that freshmen could complete specific tasks well compared to other groups. Although the discrepancies among groups are not remarkable, freshmen are in the highest position (M = 0.80, SD = 0.21) and second highest is juniors (M = 0.75, SD = 0.21) while sophomores (M = 0.74, SD = 0.21) and seniors (M = 0.74, SD = 0.19) are in equal last position.

Students' attitudes toward the use of digital technologies are positive. The study results show that seniors express the most positive attitudes to technologies, followed by sophomores and juniors, then freshmen (Table 8). Seniors have the most positive attitudes toward effective digital strategies, the importance of mobile tools, task-centered strategies, and the motivating role of digital tools. Sophomores' attitudes are the most positive in terms of metacognitive strategies, the personal significance of digital tools, curriculum-based limitations, and the use of digital tools in learning. The finding is exciting since freshmen have the best skills for using technologies. Their positive attitudes toward using digital tools are the lowest compared to other year groups of students.

The study results also describe the differences between the groups of students regarding the frequency of using digital tools. Seniors tend to use social media tools, search engines and browsing, communication tools, editing and visual representation of information (e.g., photo editing, Excel, Prezi, text editing, and email), and translation tools more than other groups of students. In contrast, freshmen, sophomores, and juniors use task-based tools (e.g., programming, audio chat, simulations, video chat), podcasts, online learning, and videos in English learning more extensively than seniors.

6 Discussion and Conclusion

The study aimed to measure EFL students' DL, which is a subset of ICT competency in Vietnamese universities. To achieve the aim, we used an adapted questionnaire to investigate students' knowledge, skills, and attitudes toward using digital technologies and the frequency of applying technologies in learning English. The study's findings show that most students can access computers and the Internet both at home and at school, and they are provided with enough facilities to apply technologies in learning. In addition, they seem to be familiar with using computers and phones to learn English. The results show that the applications of English education technologies are feasible and applicable in the Vietnamese context.

Generally, students have a good knowledge of DL and positive attitudes toward ICT usage in language learning. The results indicate that students are aware of the

Table 7: Year groups of students' self-assessment of computing skills.

	Groups	Mean (M)	SD	Mean square	F	*p*
Typing skills	Freshmen	3.65	0.72	3.793	7.456	0.00
	Sophomores	3.47	0.74			
	Juniors	3.48	0.69			
	Seniors	3.33	0.70			
Web search skills	Freshmen	3.78	0.74	1.338	2.921	0.03
	Sophomores	3.70	0.73			
	Juniors	3.61	0.68			
	Seniors	3.59	0.64			
Computer skills (the capability to use a computer)	Freshmen	3.57	0.70	1.574	3.159	0.02
	Sophomores	3.47	0.74			
	Juniors	3.52	0.70			
	Seniors	3.39	0.68			
Internet skills (the capability to use the Internet)	Freshmen	3.76	0.80	0.921	1.833	0.13
	Sophomores	3.86	0.72			
	Juniors	3.77	0.68			
	Seniors	3.76	0.70			
Digital skills (the capability to use digital technologies)	Freshmen	3.31	0.84	11.256	16.277	0.00
	Sophomores	3.10	0.82			
	Juniors	3.15	0.78			
	Seniors	2.85	0.84			
Average	Freshmen	3.61	0.66	2.607	7.718	0.00
	Sophomores	3.51	0.60			
	Juniors	3.50	0.56			
	Seniors	3.38	0.57			

significance of technologies regarding their language learning and that digital tools have a positive effect on their studies. However, students' technological skills normally range from a low level to an average level, and they do not frequently apply technologies when learning English. The findings are in line with some previous empirical studies in different contexts (Dashtestani and Hojatpanah 2020; Mabayoje et al. 2015). Those studies also explored a variety of factors affecting students' levels of DL, including the vague plans made by the Ministry of Education or the lack of facilities. In Vietnam, the education system has a long-term plan for integrating ICT in education; universities' facilities are improving to keep pace with the new policy. However, students' low to average levels of DL may have implications. They do not have many chances to apply technologies in the classroom, and the curriculum's focus point is on knowledge. Additionally, levels of teachers' technological skills may also affect students' DL. This may be a potential reason for the current findings, which show that students' attitudes toward using technologies are positive, and their digital knowledge is higher than their skills.

Regarding gender differences in DL, male students' knowledge and skills are better than those of their female peers. This result concurs with previous studies where the authors claimed that males' ICT skills are better than those of their female counterparts (e.g., Alakpodia 2014; Calvani et al. 2012). Interestingly, due to having more positive attitudes toward the use of digital tools, female students do not use technologies as frequently as males when learning English. Some previous studies concluded that attitudes could predict the use of new technologies in educational settings and that a positive attitude toward technology usage is related to the greater use of ICT tools (Albirini 2006; Potosky and Bobko 2001). Nevertheless, the findings of the current study, compared to the results of these former studies, show that female students do not use technologies more frequently than males. At the same time, they have more positive attitudes toward ICT applications when learning English. Regarding the skill ratings for using computer and Internet applications, students are not highly competent when using learning management systems, virtual worlds, web design, podcasts, wikis, and blogs, but their levels for social networking services and web search engines range from moderately high to high. This finding is similar to earlier studies' results. The authors discovered that students do not apply a wide range of digital tools in their learning and do better when social

Table 8: Year groups of students' attitudes toward the use of technologies.

Attitude	Groups	Mean (M)	SD	Mean square	*F*	*p*
Affective digital strategies	Freshmen	3.11	0.483	0.772	4.048	0.00
	Sophomores	3.22	0.399			
	Juniors	3.20	0.408			
	Seniors	3.27	0.455			
Metacognitive strategies	Freshmen	3.13	0.698	0.661	1.801	0.14
	Sophomores	3.23	0.583			
	Juniors	3.20	0.580			
	Seniors	3.15	0.616			
Personal significance of digital tools	Freshmen	3.10	0.606	0.056	0.196	0.89
	Sophomores	3.16	0.514			
	Juniors	3.15	0.541			
	Seniors	3.15	0.532			
Importance of mobile tools	Freshmen	3.12	0.641	1.917	5.979	0.00
	Sophomores	3.18	0.645			
	Juniors	3.22	0.575			
	Seniors	3.31	0.567			
Curriculum-based limitations	Freshmen	2.91	0.937	0.622	0.879	0.45
	Sophomores	3.01	0.875			
	Juniors	2.91	0.867			
	Seniors	2.99	0.812			
Task-centered strategies	Freshmen	3.23	0.720	0.953	2.379	0.06
	Sophomores	3.25	0.597			
	Juniors	3.26	0.672			
	Seniors	3.34	0.630			
Use of digital tools in learning	Freshmen	2.86	0.748	3.351	8.036	0.00
	Sophomores	3.05	0.642			
	Juniors	3.02	0.688			
	Seniors	2.88	0.628			
Motivating role of digital tools	Freshmen	3.22	0.586	2.659	8.658	0.00
	Sophomores	3.22	0.575			
	Juniors	3.22	0.554			
	Seniors	3.36	0.543			

networking or surfing the Internet. However, their knowledge and skills of using educational technologies are limited (e.g., Danner and Pessu 2013; Shopova 2014).

Concerning the discrepancies among freshmen, sophomores, juniors, and seniors' DL, the study found that seniors and sophomores have a better DL knowledge than the two other year groups, and seniors achieved the best results in DL tests compared to the other groups. Additionally, while freshmen's perceived skills are the highest, seniors' skills are the lowest among the year groups. However, seniors' attitudes toward using ICT tools are the most positive compared to other groups of students. In the literature, few studies have compared DL among different age cohorts. Those studies considered that students' skills get better as they get older, and grade level is one factor related to the development of DL (Kim, Ahn, and Kim 2019; Lazonder et al. 2020). However, the results of this study are not in complete agreement with those previous studies. Teachers should be aware of the issues surrounding suitable learning facilities for teaching English. Moreover, earlier studies indicated that students' DL levels could increase through ICT integration in teaching and learning (Ng 2012). Therefore, improvements in ICT integration may have positive effects on students' levels of DL.

As a result of the findings, the study has some implications for integrating ICT in English teaching and learning. For example, teachers, trainers, educational officials, and all educational stakeholders should be aware of students' ICT competency levels in a school context. Furthermore, training should be designed and included in the curriculum to support digital integration in education. Additionally, the current study also reports that there is the potential to integrate technologies in Vietnamese universities since students are aware of digital tools' significant advantages in learning. Furthermore, educators who work directly with students need to have knowledge and skills

concerning digital technologies to assist teaching and support students. This is because teachers affect how students learn with technologies (Margaryan, Littlejohn, and Vojt 2011), and students will not use educational technology tools if technologies are integrated without any purpose (Ng 2012). In terms of the DL gap between genders, it is suggested that teachers should understand student motivations to use digital technology can differ between males and females (Jin et al. 2020). For this reason, it is necessary to review the curriculum design and teaching methods to equip students with the DL practices that can successfully empower them in their future work.

The current study has some limitations which should be acknowledged when interpreting the results. The research covers a wide range of students from different majors in the field of language learning. To draw more specific conclusions, future researchers should focus on students in one specific field. Additionally, the study samples were collected from universities in three cities and provinces in Vietnam; hence, the study results cannot be generalized to all educational contexts. Furthermore, with regard to the participants' digital skills, because most questionnaire items required them to self-assess their skills, students may have accurately assessed their digital skills, or the gap between their perceived and actual skills may be trivial (Aesaert et al. 2017), or there may be some discrepancy between students' self-rated skills and their actual skills (Gross and Latham 2012). Future studies can investigate students' actual skills from practical digital tasks or compare their perceived and actual skills of using technology in the EFL context.

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