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The Deployment of Technology: A Strategy in Language Learning or an Intensification Tool of EFL Learners' Digital Literacy?

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Abstract

Technology has modified education in many ways, and one of them is broadening access to education and eliminating the limitations. The current study assessed whether using technology as an educational tool for language learning can simultaneously augment the EFL learners' digital literacy level. In other words, this study explored the impact of technology-based instruction on learners' digital literacy. Chosen through convenient sampling, 56 Iranian female high school students (aged 13-14) of two intact classes participated in the study. One was considered the experimental group, and the other the control group. In order to check their homogeneity, the English language proficiency level of the participants was determined by the Oxford Quick Placement Test. Students were pre-tested and post-tested on their knowledge of digital literacy through the digital literacy questionnaire. The results revealed that students who enjoyed treatment through technology-based instruction received statistically significantly higher scores on digital literacy post-tests. The results of this research delineated the role and significance of technology-based instruction in language teaching and learning in Iran. The results also indicate that while technology-based instruction was a medium in language learning, it simultaneously increased learners' digital literacy levels. The quality of teaching and learning will be improved by shifting concentration from merely conventional teaching to technology-based instruction.

Keywords:
Digital literacy, Technology-based Instruction, Language Learning, EFL Learners, Education

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Introduction

Technology has greatly impacted all aspects of human life, and among these aspects, education is one of the significant areas affected by technology. Technology has now developed access to many learning opportunities. Education can be transformed, improved, and supported via technology in several ways for both teachers and students. With the emergence of educational technology, goals, objectives, curricula, lesson plans, and teaching and learning processes have been continuously changing. Digital technology is one of the essential parts of education in today's teaching and learning process (Benson & Kolsaker, 2015), and it is changing students' learning and developing different learning attitudes and styles (Coccoli et al., 2014).

In order to use technology as a tool for learning, the students should acquire related knowledge and skills that can help them use the tool effectively. To use technology as an effective tool in education, learners should be equipped with digital literacy, which can boost the quality of the blended learning environment (Knobel, 2011, as cited in Ustundag et al., 2017). To be truly active and to have effective participation, digital literacy is a vital necessity and a prerequisite for learning in the digital age. Several skills are assigned to both teachers and students by digital literacy, including the ability to: 1. Accomplish computer-based operations, 2. Connect a functional computer system; 3. Read manuals to carry out basic technical activities; 4. Use search engines to find information of various types, such as images and videos, 5. Update anti-virus software, 6. Use educational software (Ng, 2011).

Digital literacy has a variety of aspects that can eclipse human life in the digital age. Digital literacy or competence, however, represents a broader concept and does not signify the ability to use technology tools. Unfortunately, despite the significance of DL in the current age and by increasing the need for E-learning and using online classes, technological tools, websites, and applications, most educational environments lack the facilities to exalt and upgrade the level of students' digital literacy. Moreover, the concept of digital literacy and its identity is not manifested for many of the students since many of the educators and learners contemplate DL as the ability to work with digital tools, even at the fundamental levels.

Some empirical studies have shown that technology can play a significant role in students' learning (Li et al., 2020; Sart, 2023). Studies on the effect of digital literacy or technology-based instruction on the level of learners' digital literacy remain inadequate. Therefore, the present study was designed to provide empirical support for the field by exploring the effect of technology-based instruction on Iranian EFL learners' digital literacy.

In order to satisfy the needs of the 21st century, and by the ever-increasing expansion of using computers and technology in pedagogical environments and curricula, the digital literacy framework should be applied to the classes appropriately to help learners of all levels with their educational goals (Bawden, 2008; Ng, 2012). Being digitally literate may help learners to achieve their educational goals more conveniently.

The main research questions that this study focused on were the following:

- Are there any significant differences between students who use technology-based instruction as a language learning tool and those who do not in terms of their augmentation in digital literacy?

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Literature Review

Digital literacy demands to be renewed as digital technology develops gradually over time. DL can be classified into three levels (Martin, 2006): 1. digital competence, 2. digital usage, and 3. digital transformation. Digital literacy relies on the demands of the context; by changing the demands and needs of a specific situation, digital literacy content may transform. Digital literacy is the capability to know, understand, and utilize digital tools adequately and properly to recognize, access, and analyze resources, create knowledge, and communicate with others with a focus on critical thinking (Martin, 2006). The European Framework for Digital Literacy (EFDL) defines digital literacy as follows:

Digital literacy is the awareness, attitude, and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyze, and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process. (Martin, 2006, p.155)

Bawden (2008) argues that digital literacy is an extensive concept and distinguishes four components of digital literacy: 1. underpinnings; 2. background knowledge; 3. central competencies; and 4. attitudes and perspectives. Learning the technologies through suitable tools and resources is necessary to improve digital literacy. Teaching technology in the digital age is necessary to simplify the difficulties of theories and nurture cognitive capabilities and critical thinking (Chen and Lin, 2014). Some scholars (Sabatino, 2014; Pereira and Pereira, 2015, as cited in Rafi et al., 2019) argued that game-based digital literacy develops students learning. Therefore, it is suggested that a consistent ICT program be used for learners to achieve the targets of digital literacy through skills development (Rahman et al., 2015).

In a mixed-method study, Ting (2015) explored applying the pedagogy of negotiated learning to have access to digital literacy to promote learning autonomy through Information and Communication Technology. Thirty-six students participated in this study. Based on the results of this study, it is indicated that independent learning of ICT enhances students' digital literacy and helps them acquire knowledge. UNESCO (2018) formulates more particular delineations of digital literacy as the competency to access, manipulate, comprehend, incorporate, communicate, estimate, and make information secure and achievable through digital devices and networking technologies as a form of participation in digital appliances. In another study, Tsvetkova et al. (2021) investigated the possibility of turning social media into an effective tool to improve digital literacy and facilitate cognition. Two hundred and thirty-six students participated in this study. Based on the results of this study, learning using social media can encourage learners to develop digital literacy and master the prerequisites of the 21st century.

Information and Communications Technology (ICT)

Some countries, such as Turkey, Nigeria, Japan, and Spain, as cited in (Rusydiyah et al., 2020), added the word ICT to the concept of digital literacy. ICT is the combination of networks, hardware, and software, as well as communication, collaboration, and engagement that enables the processing, managing, and exchanging data, information, and knowledge (Lloyd, 2005). Information and communication technology (ICT) is integral to many teachers' and students' learning programs. Today, the use of ICT in education is accepted as a demand. As a result,

learners in educational contexts are increasingly acquainted with ICT use in the classroom and outside of it (Wilkinson, 2007). Moreover, globalization has directed this need to incorporate ICT management within educational procedures by introducing it as a beneficial and imperative competence for countries' social and economic development.

Based on a diagram by (Ala-Mutka, 2011, as cited in Ferrari, 2012), Internet literacy, ICT literacy, media literacy, and information literacy are partly concurring with what is known as digital literacy. One of the explanations for digital literacy is the ability to use information and computer technology (ICT) to discover, assess, construct, and transmit information that needs cognitive and technical skills. This definition envelops various concepts, such as technological, cognitive, and social competence (Eshet-Alkalai, 2012). Thus, incorporating ICT shows the excellence of teaching and the standards administered by the educational institution (Livingstone, 2012). The miscellaneous approaches assigned to using ICTs in EFL teaching have approved extending the possibilities of the conventional teaching items in the class, combining with a language and ICT literacy process. Previous studies demonstrated that higher levels intensify positive perspectives toward technology (Abdullah et al., 2015). Jisc (2014, as cited in Tang & Chaw, 2015) designed a digital literacy framework in which ICT is one of the seven elements of the framework.

Computer-Assisted Language Learning (CALL)

According to Levy (1997), CALL can be described as a study of computer applications in language learning. It is not only the simple common desktop and laptop or computer devices but the networks that connect them, other devices integrated with them, and other technological innovations. Levy (1997) defines CALL more succinctly and more broadly as the search, employment, and study of applications and computer software in language teaching and learning. The fast expansion of digital technologies is broadly modifying the scenes of Computer Assisted Language Learning (CALL). Hardisty and Windeatt (1989, as cited in Gündüz, 2005) stated that the abbreviation CALL stands for Computer Assisted Language Learning. It is a term teachers and students use to describe using computers as part of a language course. It is significant for language learners and instructors to improve digital literacy competence and strategies to benefit the employment of digital technologies for language learning in digital contexts (Son et al., 2017). Computer Assisted Language Learning (CALL), designed for language teaching, reinforces student-centered language learning and assists them in improving their communication skills as well (Gonglewski, 2003, as cited in Yılgın, 2023).

Mobile-Assisted Language Learning (MALL)

Incorporating technology to engage a handy small device to be used anytime and anywhere, such as a Mobile-Assisted Language Learning (MALL) smartphone, is possible (Rosita et al., 2019). From an educational perspective, digital literacy allows learners to study outside of class. Using their gadget, students can use their mobile phones to look for answers to their questions using a search engine. Digital literacy allows students to achieve learning objectives through gadgets and tools. The significance of digital literacy and the employment of MALL in education encourage researchers to explore the profitability of technology for language learners (Gultom et al., 2022). Many studies confirmed the impact of stimulating the learning context on the learners' accomplishment in a classroom (Jannati & Marzban, 2015, as cited in Ghanizadeh et al., 2022).

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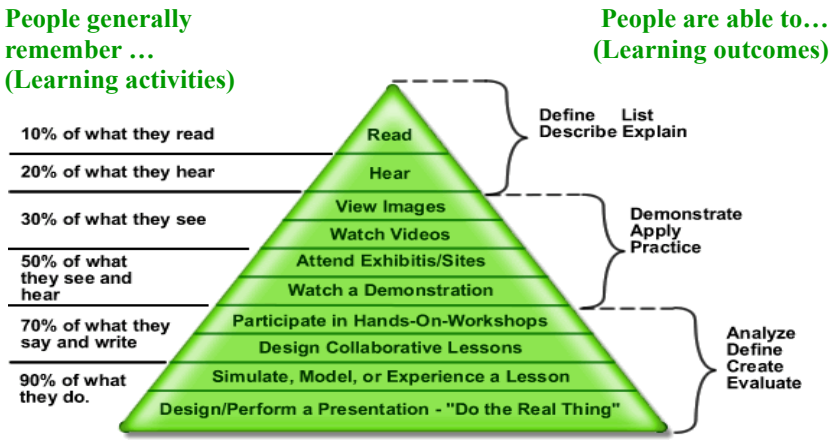
Juliana et al. (2023) asserted that using mobile devices enabled the learners to access the materials and facilities to advance extensive reading exercises, encouraging learners to incorporate digital literacy into learning. It is essential to consider that learners' perspectives towards language learning can be affected by MALL.

According to Cone of Experience of Edgar Dale (1969), learning accomplished with real experiences influences the involvement of learning up to 90%. Learners can understand better when directly involved (Sari, 2019). Based on this theory, students will learn better using all their five senses. In other words, while learners use more senses, learning will be easier and faster.

Figure 1

Edgar Dale's Cone of Experience



There are some studies on the effect of DL, ICT, CALL, and MALL on the learners' language learning and the impact of digital tools on digital literacy. Nevertheless, there is insufficient research on technology's effect on language learning, especially in Iran. Therefore, in light of these points highlighted by previous literature, this study explored the effect of technology-based instruction on the learners' level of digital literacy.

Method

Design

This study is descriptive and follows an experimental design. The design is considered quasi-experimental since two intact classes were used as the experimental and control groups. Figure 3.1 demonstrates the schematic design of the study, in which the independent and dependent variables, the control variables, and the intervening item are displayed.

Figure 2

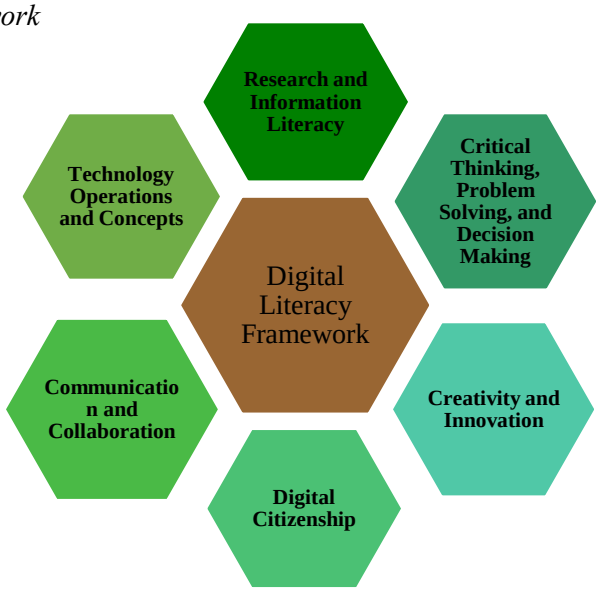
The Schematic Design of the Study

Digital Literacy Framework

A framework that was defined and employed in the study was the digital literacy framework. The Provincial Government of British Columbia, Canada (as cited in Rahman et al., 2021) conducted a digital literacy framework that contains six subsections. Concerning this framework, digital literacy is a person's attraction, perspective, and capability to employ digital technology. This framework was introduced and taught to the experimental group's participants in this study.

Figure 3

Digital Literacy Framework



Participants

The sample included female Iranian EFL learners, all of whom were native speakers of Persian, and English was considered as their foreign language; none of them had ever been to an English-speaking country, and they were at the pre-intermediate level in English.

Instruments

Oxford Quick Placement Test

To elicit information about learners' proficiency levels and to get a homogenous group, the Oxford Quick Placement Test was applied. The OQPT test indicated scores between 1 and 60 on the scale. Pre-intermediate level learners have been chosen to have homogeneous groups. It consisted of 60 multiple-choice questions in two parts. Based on the European framework of language proficiency levels (Council of Europe, 2001), scores between 24 and 30 out of the 40 questions of the first part of the OQPT show that the students are at the pre-intermediate level (Gentil & Meunier, 2018).

Digital Literacy Questionnaire

The digital literacy (DL) questionnaire was designed and developed by Dashtestani and Hojatpanah (2020) and consisted of a set of questions using a five-point Likert scale format. The questionnaire has four sections and consists of 41 items, including the following indicators: students' frequency of using digital devices, students' purpose of using digital devices, students' levels of digital literacy, and students' frequency of using digital applications. Ordinarily,

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Cronbach's alpha is accepted at 0.70, although it is admissible at 0.60 in experimental research (Hair et al., 1998). Cronbach's Alpha coefficients (0.66–0.88) delineated an acceptable level of reliability for the items of the digital literacy questionnaire.

The experts assessed the content of the translated version of the questionnaire to ensure its validity. For the present study, the researcher determined the internal consistency of 41 items using Cronbach's alpha through data collected from the participants. Since the digital literacy questionnaire had four subsections, the reliability of each one is calculated separately for the pre-test and post-test. The obtained indexes are indicated in Table 1 as high and acceptable.

Table 1

Reliability Statistics of Digital Literacy Questionnaire

Reliability Statistics			
Subsection	N of Items	Pre-test Cronbach's Alpha	Posttest Cronbach's Alpha
Level of Competence	15	.940	.876
Use of Technology	4	.717	.764
Devices	7	.791	.665
Software and Applications	15	.888	.871

Data Collection Procedures

In order to achieve the purpose of the current study, the following procedures were carried out. This study was quasi-experimental with a pretest-posttest design involving one experimental group and one control group. The coursebook that the English language department of the school selected for the students was "Connect 3", which is appropriate for learners of the pre-intermediate level.

Notwithstanding the placement of the learners by the school's language experts, the OQPT was administrated to ensure students' level of proficiency and homogeneity of the participants in both groups as a double check. In the second stage, the digital literacy questionnaire was given to all the participants as the pre-test. The participants were given as much time as they wanted since performance under time pressure was not the aim.

The experimental group was instructed through technology-based learning resources and activities and received the treatment required to develop their digital literacy skills, and the control group had conventional classroom instruction. The treatment in this study was technology-based instruction, which consisted of a pamphlet about digital literacy concepts to conceptualize digital literacy for learners. It introduced the exact meaning of digital literacy, its dimensions, its necessity in the current digital age, and how to use digital literacy strategies in the classroom context, such as managing online identity, emphasizing the importance of critical thinking, and managing digital distraction. Table 2 shows the selected digital tools or applications used for each subsection of the digital literacy framework.

Table 2

The Treatment

Instruction	Tools	Digital Literacy Framework
Social network sites	YouTube Pinterest Instagram	Research and Information Literacy Digital Citizenship Communication and Collaboration
Microsoft Office Microsoft Office	PowerPoint Word	Creativity and Innovation Technology Operations and Concepts
Wikipedia Search engines	Google Mozilla Firefox Bing.com	Research and Information Literacy Critical Thinking, Problem-Solving, and Decision Making
Computer-based dictionaries	The Oxford Dictionary Word Web Free Dictionary Word Book	Technology Operations and Concepts Research and Information Literacy
Online dictionaries	Merriam-Webster Dictionary Oxford English Dictionary Cambridge Online Dictionary	Technology Operations and Concepts Research and Information Literacy
Mobile-based dictionaries	Longman Dictionary Oxford Dictionary of English English Dictionary	Technology Operations and Concepts Research and Information Literacy
Computer games	“Civilization VI” “Deponia” “21 Days”	Technology Operations and Concepts Research and Information Literacy Creativity and Innovation
Online games	www.gamestolearnenglish.com www.eslgamesworld.com www.englishclub.com	Technology Operations and Concepts Research and Information Literacy Creativity and Innovation
English videos	YouTube British Council Speech yard	Communication and Collaboration Critical Thinking, Problem-Solving, and Decision Making Research and Information Literacy
English websites	Duolingo FluentU British Council	Communication and Collaboration Research and Information Literacy
Sending and receiving emails	Gmail	Technology Operations and Concepts Communication and Collaboration
English learning applications	Cake Audible Busuu	Research and Information Literacy Technology Operations and Concepts
English podcasts	Easy English expressions All ears English British Council	Research and Information Literacy Technology Operations and Concepts Digital Citizenship

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For the augmentation of learners' digital literacy in the current study, the treatment embraced the following subcomponents: using social network sites, using Microsoft Office PowerPoint, using English websites, playing computer games, using Microsoft Office Word, playing online games, using computer-based dictionaries, using online dictionaries, using mobile-based dictionaries, using Wikipedia, using search engines, using English videos, sending and receiving emails, using English learning applications, using English podcasts, and introducing and working with the most critical digital literacy tools. However, due to the school's limited time and lack of digital tools, some activities were selected to be accomplished outside the class, such as the learners' homework or activity.

Respecting the employment of technology-based instruction, the researcher aimed to maximize the participants' learning through the treatment. Thus, most of the activities were designed to be in accord with the several levels of Edgar Dale's cone of Experience. The units of the book are mentioned in the following Table, indicating how the treatments' activities correspond to different levels of Edgar Dale's cone of experience and to what extent the activities were practical about the cone of experience.

Table 3

Correspondence of Activities of Each Unit with Edgar Dale's Cone of Experience

Connect 3 Units	**Cone of experience**
Unit one: Back to school	Attend exhibits/sites, hear, design a collaborative lesson
Unit two: Fun times	Attend exhibits/sites, view images, simulate, model, or experience a lesson, participate in hands-on workshops, design/ perform a presentation, read, hear, and watch a demonstration
Unit three: Going places	Watch videos, read, hear, simulate/ model, or experience a lesson
Unit four: Comparisons	Simulate/ model, or experience a lesson, watch videos, design a collaborative lesson, read, hear, and participate in hands-on-workshops
Unit five: Your health	Design/ perform a presentation, participate in hands-on-workshops, read, Simulate/ model, or experience a lesson, hear
Unit six: Special events	View images, watch videos, participate in hands-on-workshops, read, and design a collaborative lesson
Unit seven Our stories	Read, hear, participate in hands-on-workshops, watch videos, Simulate/ model, or experience a lesson, watch a demonstration, Simulate/ model, or experience a lesson, attend exhibits/sites
Unit eight: In the city	View images, attend exhibits/sites, read, watch videos, Simulate/ model, or experience a lesson

Data Analysis Procedures

The collected data was analyzed with IBM SPSS Statistics 26th version; the results were presented in tables. The Tests of Homogeneity of Variances were employed to analyze the homogeneity of the scores. Additionally, Kolmogorov-Smirnov Tests were calculated to check the normality of distribution. Also, independent sample t-tests were performed to elucidate the significant differences existing in the experimental and control groups. In addition, paired sample t-tests were

run to examine whether there were any significant differences in the means of digital literacy's pre-test and post-test. Moreover, Cronbach's alpha was utilized to estimate the reliability of the questionnaire's subsections.

Findings

The findings of this research question are presented as follows. Table 4 indicates the results of group statistics for the Oxford Quick Placement Test (OQPT) scores administered to double-check the proficiency level of the participants. Measures of central tendency (mean: 26.53, median: 27, min: 21, and max: 33) and dispersion (range: 12, variance: 6.39, and standard deviation: 2.52), along with measures of distribution (Skewness and Kurtosis), were computed for the Oxford Quick Placement Test.

Table 4

Descriptive Statistics of the OQPT

Descriptives				
			Statistic	Std. Error
OQPT	Mean		26.5357	.33803
	95% Confidence Interval for Mean	Lower Bound	25.8583	
		Upper Bound	27.2131	
	5% Trimmed Mean		26.4841	
	Median		27.0000	
	Variance		6.399	
	Std. Deviation		2.52957	
	Minimum		21.00	
	Maximum		33.00	
	Range		12.00	
	Interquartile Range		3.00	
	Skewness		.226	.319
	Kurtosis		-.139	.628

The researcher conducted Levene's test to endorse the homogeneity of both groups regarding their scores on OQPT. Table 5 reveals that the Levene statistic was 0.012 with a significance of 0.914, which indicated the homogeneity of variances when performing the OQPT.

Table 5

Test of Homogeneity of OQPT

Test of Homogeneity of Variances					
		Levene Statistic	df1	df2	Sig.
OQPT	Based on Mean	.012	1	54	.914

Figure 6 demonstrated that the calculation of the Q-Q plot suggested that values follow a normal distribution reasonably well.

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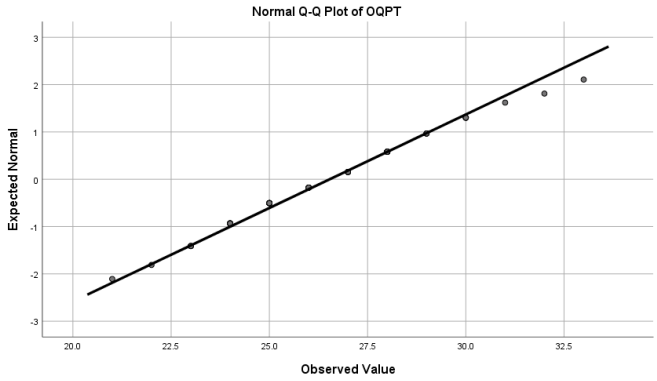
Figure 6

Normal Q-Q Plot of OQPT



The descriptive statistics related to the obtained scores on the digital literacy questionnaire are presented below.

Table 6

Paired Samples Statistics

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Control DL pre-test	155.1481	27	18.02072	3.46809
	Control DL posttest	158.4074	27	16.14659	3.10741
Pair 2	Experimental DL pretest	152.2414	29	21.99782	4.08489
	Experimental DL posttest	174.1379	29	19.26270	3.57699

According to Table 6, the control group's mean score of pre-tests of digital literacy (N=27, SD=18.02) is 155.14. Also, the control group's mean score of post-tests of digital literacy (N=27, SD=16.14) is 158.40, respectively. The Table shows that the control group performed more or less similarly on the pre-tests and post-tests. As the Table shows, the mean score of the pre-tests of (N=29, SD=21.99) for the experimental group is 152.24, and the group's mean score of post-tests of digital literacy (N=29, SD=19.26) is 174.13, respectively.

The results of the paired samples t-test compare the digital literacy pre-test and post-tests for the control group participants who did not experience the treatment, as Table 7 shows. The results of the comparison between the pre-and post-test of digital literacy taken by the control group revealed that the participants' level of digital literacy did not increase notably at the end of the study. Moreover, It demonstrates no statistically significant difference in the score of the participants from their pre-test to their post-test of digital literacy ($p>.05$, SD=19.59, df=26, $t=.86$). In other words, the control group did not progress in terms of their digital literacy ($p=.395$). It indicates no statistically significant difference between the participants' performance in digital literacy in the control group before and after the study.

Table 7

Paired Samples t-test for the Experimental and the Control Groups' Pre- and Post-Tests

Paired Samples Test									
Tests	Group	Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Control pretest – posttest	-3.25926	19.59119	3.77033	-11.00928	4.49076	-.864	26	.395
Pair 2	Experimental pretest –posttest	-21.89655	27.09948	5.03225	-32.20464	-11.58846	-4.351	28	.000

The Table also shows the results of the paired samples t-test comparing the digital literacy pre-test and post-test for the participants who experienced technology-based instruction. As displayed in the Table, there is a statistically significant difference, at the 0.05 level of significance, between the pre-test to post-test scores for the digital literacy level of the experimental group ($p < .05$, df=28, t=4.35). This difference suggests an enhancement in the learners' performance in terms of their digital literacy before and after the treatment. According to the Table, participants in the experimental group improved their digital literacy level during the experiment. As illustrated in Table 4.4., the participants' partial digital literacy increased remarkably between the pre-and post-tests in the experimental group.

The data gathered from both groups were compared. To this end, independent samples t-tests were run to find out whether the technology-based instruction had any impact on the growth of digital literacy of the participants in the experimental group compared to that of the control group,

Table 8 shows that the experimental group's mean score of the pre-tests (N=29, SD=19.26) is 174.13, and the control group's mean score of the post-tests of digital literacy (N=27, SD=16.14) is 158.40, respectively.

Table 8

Descriptive Statistics of the Experimental and Control Group

Group Statistics					
	STUDENTS	N	Mean	Std. Deviation	Std. Error Mean
Post Digital Literacy	Experimental group	29	174.1379	19.26270	3.57699
	Control group	27	158.4074	16.14659	3.10741

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As Table 9 demonstrates, the results of the Kolmogorov-Smirnov Test (n=50) show that the p-value is greater than 0.05 (p = .200). Thus, the distribution of scores was reasonably normal.

Table 9

Test of Normality of Digital Literacy's Post-test

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Posttest Digital Literacy	.079	56	.200*	.975	56	.293
*. This is a lower bound of the true significance.						
a. Lilliefors Significance Correction						

Table 10

Independent Samples t-Tests for the Experimental and Control Groups' Digital Literacy

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
DL post-test	Equal variances assumed	.584	.448	3.299	54	.002	15.73052	4.76843	6.17039	25.29066
	Equal variances not assumed			3.320	53.435	.002	15.73052	4.73824	6.22863	25.23242

The T-test in Table 10 compares the two groups' digital literacy post-tests. The results indicate a considerable difference between the participants' performances in the experimental and control groups [p>.05, p =.448, df=54, t=3.29, sig. (2-tailed) =.002]. These results suggest that the experimental group showed improvement after the treatment. Considering the results from Table 10., the experimental group seems to have progressed in digital literacy, while the control group did not.

Discussion

The interpretations of the study revealed that at the beginning of the experiment, both groups had similar performances since there was no significant difference between them. However, at the end of the study, the learners in the experimental group had increased their level of digital literacy considerably, while the control group did not disclose much progress. These outcomes showed that technology-based instruction as an educational tool developed the Iranian EFL learners' level of digital literacy. The results also indicate that while technology-based instruction was a medium to teach the English language, it concurrently increased the level of learners' digital literacy.

The findings of this research question are confirmed by the results of a study by Ting (2015), in which he explored applying the pedagogy of negotiated learning to have access to digital literacy to promote learning autonomy through Information and Communication Technology. Based on the results of this study, it is indicated that independent learning of ICT enhances students' digital literacy and helps them acquire knowledge. Also, the results are in line with the studies by some scholars (Rahman et al., 2015; Chen and Lin, 2014), who argued that learning technologies through suitable and sufficient tools and resources is necessary to improve digital literacy.

In agreement with the study by Tsvetkova et al. (2021), the potentiality of turning social media into an effective tool to improve digital literacy and facilitate cognition was investigated. Based on the results of this study, learning using social media can encourage learners to increase their level of digital literacy and master the prerequisites of the 21st century. Regarding the research question, the outcomes showed that technology-based instruction as an educational tool developed the Iranian EFL learners' level of digital literacy. The results revealed that students in the experimental group outperformed their counterparts in the control group. Furthermore, the results of the learners' performance on the questionnaire of digital literacy indicated that the experimental group benefited notably from the digital literacy framework and augmented their digital literacy at the end of the study. The control group, on the other hand, did not show any noteworthy development concerning its digital literacy after the procedure ended.

One explanation for this might be that employment of ICT and digital tools provides the learners with various uses of technology in different contexts, accompanied by applications, podcasts, online videos, online, mobile, and computer-based dictionaries, games, websites, and social network sites with which a lesson is associated. On the other hand, the control group that already had conventional learning during the study did not improve in digital literacy. This is probably due to the invariant learning of English lessons with low facilities.

Conclusion

Digital literacy has a significant impact on communicating, teaching, and learning. Thus, learners should have the chance to use digital tools to access, experience, and grasp the concepts and functions of educational life. For this purpose, learners should be instructed before deploying digital literacy in foreign language learning activities. Employing digital technologies for language learning is the most modern way, and it requires internet access and gadgets in addition to digital literacy. As a final point, it is possible to say that digital literacy is not a purpose but a tool for all humanistic necessities, including learning.

Several shortcomings were revealed while conducting the present study. Except for the context and sample, one of the main challenging phases is the acceptance of the institutes, teachers, and students to change their teaching and learning methods. Furthermore, since students were prevented from bringing their smartphones, tablets, or laptops to school, some activities were done outside of the learning environment by the students, which might cause a lack of precision and accuracy while doing the activity. Another significant limitation of this study was that teachers had trouble teaching through new technologies and had preferences for traditional ways of teaching; thus, the researcher was the instructor in all experiment sessions.

On the other side, some students consider the learning process through technology inconvenient, in addition to the experience of learning with a new instructor.

Further studies can be carried out by collecting data from EFL learners of language institutes in other contexts with different proficiency levels and genders, in which the learners can use their digital tools and gadgets freely. Due to the lack of technological and ICT tools, future studies can be done in computer laboratories of universities or schools' computer rooms that provide learners with computers, ICT and digital tools, and internet connections. Lastly, the study only included female participants. Similar studies can be done that include only male participants or even both.

The findings of this study can be beneficial for EFL learners, teachers, and material developers in this field. The results of this experiment inform both the substantive literature on digital literacy and guide how technology-based instruction can be used for future research in this area. The results of the current study assist syllabus designers in supplying more purposeful syllabi considering multilateral activities, effective language learning applications, digital tools and technology, and compelling content.

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