

**Research Article**

Does Digital Literacy Provide Evidence for Iranian EFL Learners' Cooperative Learning in Online Classrooms?

Zeinab Abedi*  and Mona Tabatabaee-Yazdi 

English Department, Tabaran Institute of Higher Education, Mashhad, Iran

* **Corresponding author:** Zeinab Abedi, English Department, Tabaran Institute of Higher Education, Mashhad, Iran. Email: zeinababedi717@gmail.com**ARTICLE INFO****Article History:**

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ABSTRACT

Introduction: Technology can revolutionize how members of cooperative groups interact and work with others. Since digital literacy and cooperative skills are necessary for teachers' success and students' achievement, the current research aimed to find the relationship between English as a foreign language (EFL) learners' digital literacy and their attitude towards cooperative learning in online classes.

Methodology: The present research followed a quantitative study using a correlational research design to investigate the relationship between Iranian EFL learners' digital literacy and their attitudes toward cooperative learning in online classrooms. In this study, 210 participants, who were all Iranian EFL students in different fields of study and from different cities, were invited to participate. They were from both genders and of different ages. For data collection, the researcher used a Google form link sent via social media and students were asked to complete the questionnaires online. The responses from participants were collected and analyzed using SPSS. Mean, standard deviation, multiple linear regression, and independent samples t-tests were run to analyze the obtained data and check whether the results were significant.

Results: The findings of the study indicated a significant relationship between the two variables, meaning that learners could learn and collaborate better with technology. Besides, the study results showed that the second component of digital literacy (technical dimension), as the best predictor, significantly predicted a 34% variance in learners' attitudes toward cooperative learning. Moreover, there was no significant difference between men and women in digital literacy and their attitudes toward cooperative learning.

Conclusion: The results of this study indicated that the participants had a favorable view of using digital literacy in their attitude toward cooperative learning. Therefore, there is a need to change the English classroom curriculum and employ a proper syllabus to integrate digital literacy.

1. Introduction

All over the world, particularly in educational settings, people are cooperating on many different ideas and activities. However, the rapid spread of the COVID-2019 pandemic in the early 2020s has made a challenge for the entire educational environment. Thus, the need to use technology and online tools for communication and education has increased. This growth of technology use among educators leads to the advancement of the digital era. Accordingly, digital literacy (DL), a term that emerged as

literacy through technology, has been noticed by researchers and educators since learners and teachers need to develop a kind of DL to use it effectively in classrooms (Ferrari, 2012).

Digital technology is now used by students to accomplish a wide variety of tasks. Students can send and receive emails, read e-books and online content, participate in online academic discussions, and use learning management systems (Kim & Choi, 2018). The concept of DL has become

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related to many fields, from education to health sciences, law, banking, commerce, and media, depending on the developments in the internet and mobile applications (McDougall et al., 2018). It requires having functional and digital skills while accessing information (Polizzi, 2020). It also covers the basic knowledge and skills that will enable the individual to be safe in online environments (Yalçinkaya & Cibaroğlu, 2019).

Cooperative learning (CL) is a teaching method based on a combination of instructional strategies in which the pupils work together to upgrade their own and each other's learning to achieve their goals (Johnson et al., 2013). It is confirmed that CL is an operative teaching strategy for both teachers and learners. It inspires learning to occur and allows communication skills to be fostered among students (Jacobs et al., 2006). Moreover, it offers a non-threatening learning situation that inspires English as a foreign language (EFL) students to overcome their anxiety in interaction and stating their ideas in a foreign language (Slavin & Cooper, 1999).

Despite the benefits of CL, students struggle with the implementation of CL strategies in classroom activities. Le et al. (2018) point to the lack of cooperative skills in students. Völlinger and Supanc (2019) emphasize the low knowledge of faculty members as a constraint on the implementation of CL in university classrooms. In addition, constraints, such as a negative attitude to collaboration (Laal & Ghodsi, 2012), dependence on others for problem-solving (Nokes-Malach et al., 2015), the lack of time considered in the curriculum (Buchs et al., 2017), the loss of teaching time for the subject matter (Lumpe et al., 1998), students' lack of group work skills (Le et al., 2018), sense of misunderstanding in students (Hennebry & Fordyce, 2018), students' differences including gender, age, education, and English language skills (Chen & Squires, 2007), and low instructors' knowledge (Völlinger & Supanc, 2019) are effective on the level of student's cooperation. Moreover, Gillies and Boyle (2009) acknowledge that in doing group work, some learners are often passive. One way to make them more active is the integration of technology into learning and teaching. Technology can provide students with immediate feedback, and make them cooperate in learning to read, write, discuss, work with several media simultaneously, and engage in inquiry projects that take place in any corner of the world (Gillies & Boyle, 2009). Thus, technology can revolutionize how members of cooperative groups interact and work with others. Since DL skills and cooperative skills are necessary for both teachers' success and students' achievement, the current research aimed at finding the relationship between EFL learners' DL and their attitude toward using CL in online classes.

1.1. Review of the related literature

The theoretical groundwork of CL is based on the theory of social constructivism which highlights the learners' need to participate actively in the learning process. Regarding this theory, the CL results in the co-construction of communication (Storch, 2005). Furthermore, the CL approach is linked to the motivation theory (Gonzales & Torres, 2015; McLeish, 2009; Pan & Wu, 2013) which

stresses individual learner's tendency to communicate with others in classrooms. It precisely emphasizes the notion that learners socially and individually build the knowledge themselves (Hein, 1991). Hence, it desires learners to be involved in the learning procedure. Consistently, the role of peer feedback and pair work was a noticeable topic for researchers (Cheng, 2019). Accordingly, learners should experience learning together where they are motivated and encouraged to critically explore their learning situation. This pedagogy provides long-term retention of knowledge through peers scaffolding when they experience peer feedback by working together (Atkinson, 2003; Donato, 1994; McLeish, 2009).

Besides, 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 (Soroya & Ameen, 2020). Accordingly, the 21st century has witnessed the spread of ICT in improving efficiency, communication, decision-making, and administering progress in various fields (Din et al., 2017). Similarly, Roche (2017) highlights DL as the ability to evaluate, utilize, and generate information employing digital media engaged with individuals and 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. Thus, the teachers need to internalize these new teaching methods and their underlying procedures for the paradigm shift to be completed (Wang & Ryan, 2023). Student-centered activities are very time-consuming in general and CL activities in particular since less content is covered in a CL classroom than in a typical teacher-facing classroom (Jacobs & Ivone, 2020). Accordingly, CL encourages and improves the performance of students by providing support in their academic and personal growth, fostering healthy relationships among students, which results in the formation of a learning network that values diversity, and providing them with the experiences they need to make solid social, mental, and intellectual progress (Botha, 2021; Çolak, 2015; Luo, 2018).

Considering the literature, Karim (2018) recognizes several advantages of using CL strategies, such as fun, interactive, and critical thinking growth. Besides, Sharp (2018) explored perceived levels of confidence and importance with collaborative DL practices among adult learners in digital learning environments by applying a quantitative pre-post-test design. Findings revealed a statistically significant relationship between participants' perceived levels of confidence in collaborative DL practices. The role of educators implementing CL changes from transferring knowledge to facilitators of learners' learning (Shakibaei et al., 2019). This role encompasses helping, coaching, and modeling. Educators who accept this role should keep a safe, non-threatening, and learner-centered situation. This situation of teaching will aid learners in contributing completely to the cooperative tasks assigned to

their group (Abedi et al., 2019). Alghamdy (2019) studied EFL learners' ideas about CL. The participants were 10 tenth-grade male students, aged 14-15 years old. The results demonstrated that many students believed CL allowed them to progress their English skills, have different roles, make novel relations with other classmates, and enhance their oral presentation skills. Some investigators contend that the main elements of CL offer a means of endorsing learners' intrinsic motivation (Abedi et al., 2019; Ziafar & Namaziandost, 2019). These elements contain learners' satisfaction from helping others and being part of a group effort and their improved sense of control over and ownership of their learning. Meena (2020) conducted a study to find out the impact of CL strategies on EFL learners' speaking. The study was composed of 48 first-year students. The results of this experimental study indicated that CL had a significant impact on improving EFL learners' speaking skills. Besides, Eryansyah et al. (2019) assessed EFL students' current digital knowledge and skills on the use of ICT in language learning and the need to meet modern life skill requirements. The sample included 119 EFL students. The results revealed that ICT has already been used as a language learning tool and students have a positive attitude toward using ICT in language learning. They generally have basic knowledge and skills to use computers but not enough skills to use information technology. In the same vein, Eryansyah et al. (2020) investigated the DL skills of pre-service EFL teachers at a public university in Indonesia and the factors that influence their development of DL skills. The results of the study showed that most of the preschool English teachers in this study were at a good level of DL skills, and it was found that the DL of the preschool English language teachers was above the appropriate level. Using the qualitative method, Mardiah (2022) investigated the integration of DL competencies into EFL classes through a CL approach. The participants of the study were 37 students in the 6th semester of the English Education Department class of the State Islamic University of North Sumatera. The research findings showed that students who were dominated by Generation Z were literate enough to perform DL skills through the CL approach. Moreover, Heidari and Tabatabaee-Yazdi (2021) investigated Iranian EFL instructors' and students' DL. Using independent samples t-test, they found that Iranian EFL teachers' scores were higher than students in all constructs of DL scales. Bagherpour et al. (2022) asserted the effects of different modes of technologically-based instruction on intermediate students' communication and cooperation in a flipped classroom context.

Accordingly, although cooperation is a common practice in education, there is a big gap in the literature concerning English learners' attitudes toward using CL in online classes. Thus, in this study, the researcher tries to find a relationship between Iranian EFL learners' DL and their attitude toward using CL in online classrooms. The present study was to provide answers to the following research questions:

Q1: Is there any significant relationship between Iranian EFL learners' DL and their attitude toward using CL in online

classrooms?

Q2: Which component of Iranian EFL learners' DL is the best predictor of their willingness to cooperate in online classrooms?

Q3: Is there any significant difference between Iranian EFL learners' willingness to cooperate in online classrooms regarding their gender?

2. Methodology

2.1. Participants

The acceptable number of participants for different statistical analyses depends on different factors, such as power and probability level. A typical research study should have a significance level of 5%, an effect size of 50%, and a statistical power of 80% (Hair et al., 2013; Marcoulides & Saunders, 2006). Concerning correlational studies, given the probability level of 0.05, the effect size (Cohen's *d*) of 0.5, the minimum expected correlation coefficient of 0.20, and the power level of 0.8, the minimum required total sample size would be 194 (Hulley et al., 2013). Therefore, this study invited 210 Iranian high-intermediate and intermediate EFL learners (Male= 53, Female= 157) to take part randomly in the study. They were from the fields of teaching English as a foreign language, English translation, and English literature. Their age ranged between 17 to 66 years (Mean= 29, SD= 1.75).

2.2. Instruments

2.2.1. Digital Literacy Questionnaire

A questionnaire was used to find out learners' level of DL. This 17-item, four-dimension widely-used questionnaire was designed and validated in the English Language by Ng (2012) on a five-point Likert scale ranging from strongly disagree to strongly agree (Appendix A). The four dimensions include attitudes (items 1, 2, 3, 4, 6, 13, and 14), technical (items 7, 8, 9, 10, 11, 16), cognitive (items 12 and 17), and social-emotional statements (items 5 and 15). The first dimension seeks to find participants' attitudes toward DL. The technical dimension of being digitally literate means possessing the technical and operational skills to use ICT for learning and everyday activities. The cognitive dimension of Ng's (2012) DL model is associated with the ability to think critically in the search, evaluate, and create a cycle of handling digital information. It also means being able to evaluate and select appropriate software programs to learn with or to do a specific task. This dimension of DL requires the individual to be knowledgeable about ethical, moral, and legal issues, such as copyrights and plagiarism. The social-emotional dimension of DL involves being able to use the Internet responsibly for communicating, socializing, and learning, and protecting individual safety and privacy by keeping personal information as private as possible. The Cronbach's alpha of the questionnaire was 0.90. The data were collected online via Google form, and the participants needed 5 minutes to fill out the questionnaire.

2.2.2. Attitude toward Cooperative Learning Questionnaire

The questionnaire of attitudes toward using the CL was developed and validated by McLeish (2009). It is a widely-used questionnaire with 12 items on a 5-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The Cronbach's alpha of the questionnaire was reported to be .90. The questionnaire was developed in the English language. The data for the questionnaire were collected online via Google form, and the participants needed 3 minutes to fill out the questionnaire.

2.3. Procedure

In this study, 210 participants, all Iranian EFL students from various fields of English and from different cities were randomly invited to complete the questionnaires. They were from both genders and of different ages. For collecting the data, the researchers used a Google form link that was sent via social media, and students were asked to fill out the questionnaires online. Collecting data started in October 2022 and lasted for about 3 months. The responses from participants were collected and analyzed using SPSS. To this end, mean, standard deviation, multiple linear regression,

and independent samples t-tests were run to analyze the obtained data and also to check whether the results were significant or not. The study followed a quantitative-correlational research design as it attempted to investigate the relationship between Iranian EFL learners' DL and their attitudes toward using CL in online classrooms.

3. Results

Table 1 presents descriptive statistics detailing the demographic information of the gathered data. The study involved 210 EFL learners, with mean scores of 66.06 (SD = 10.51) for DL and 46.77 (SD = 7.88) for attitudes toward using CL. Moreover, the mean age score of the participants was 29.70, with a standard deviation of 1.75. To reveal the normal distribution of data, the Kolmogorov- Smirnov test, which shows whether a distribution represents the characteristics of a normal distribution, was used. Table 2 shows the result of the normality test. As can be seen, the obtained p value was higher than .05. Thus, it can be claimed that the data was normally distributed. To answer the study's research question, Pearson product-moment correlation was used. The results are presented in Table 3. As can be seen, the level of significance was less than 0.05, which means there was a significant relationship

Table 1
Results of Descriptive Statistics

		N	Mean	Std. Deviation
Digital literacy	Male	53	65.74	10.83
	Female	157	66.17	9.87
Total digital literacy		210	66.06	10.51
Attitude toward cooperative learning	Male	53	46.17	7.82
	Female	157	46.97	7.90
Total Score		210	46.77	7.88

between the Iranian EFL learners' DL and their attitude toward using CL. Furthermore, the correlation value was .47, signifying a moderate correlation between the two variables. According to the results, a significant meaningful relationship between the Iranian EFL learners' DL and their attitude toward using CL was observed. To answer the second research question, a multiple regression was run between the dependent variable (attitude toward CL) and the four components of DL to predict the extent to which these components can explain the value of correlation with the dependent variable. Table 4 shows the results of the descriptive statistics. As can be seen, the mean scores of the participants for attitude toward CL as the dependent variable was 46.77, with a standard deviation of 7.87. Besides, the mean of the DL first construct (attitudes statements) was 28.06, with a standard

Table 2.
Results of Kolmogorov-Smirnov Test of Normality for the Two Variables of the Study

	Kolmogorov-Smirnov ^a Statistic	df	Sig.
Digital literacy	.06	210	.190*
Cooperative learning	.06	210	.087

**p < 0.05

Table 3.
Results of Pearson Correlation for Digital Literacy and Learners' Attitude toward Cooperative Learning

Pearson Correlation	Digital literacy	Cooperative learning
Attitude toward cooperative learning	.472**	1
Sig. (2-tailed)	.000	
N	210	210

**p < 0.01

Table 4.
Results of Descriptive Statistics for the Components of Digital Literacy and Learners' Attitude toward Cooperative Learning

	Mean	Std. Deviation	N
Attitude toward cooperative learning	46.77	7.87	210
Digital literacy (attitudes)	28.06	5.11	210
Digital literacy (technical)	22.71	3.89	210
Digital literacy (cognitive)	7.57	1.52	210
Digital literacy (social-emotional)	7.41	1.63	210

deviation of 5.11. The mean score of the second construct (technical dimension) of DL was shown to be 22.71, with a standard deviation of 3.89. Moreover, the mean of the DL third construct (cognitive dimension) was 7.57, with a standard deviation of 1.52. The mean score of the fourth construct (social-emotional dimension) of DL was shown to be 7.41 with a standard deviation of 1.63. The results of the model summary are shown in Table 5.

Table 5.
R Square Table for the Digital Literacy Components as the Predictor of Learners' Attitude toward Cooperative Learning

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.392	.153	.137	7.311

Table 5 shows how the two variables are related to one another. Column R shows the strength of the relationship between the dependent variable and the predictor variables. Accordingly, the $r = .392$ showed a weak correlation between the components of the DL and learners' attitudes toward using CL. The R square of .153 indicated that about 15% of the variation in learners' attitudes toward using CL can be explained by participants' DL. To assess the statistical significance of the result, it was necessary run ANOVA. The results of the one-way ANOVA test are shown in Table 6.

Since the significance value was less than .05, it could be concluded that the regression model significantly predicted the learners' attitudes toward using CL. The results of the multiple regression analysis between components of DL and attitudes toward CL are reported in Table 7.

Table 7.
Multiple Regression Analysis Between Components of Digital Literacy and Attitude toward Cooperative Learning

Model	Unstandardized Coefficients			t	Sig.
	B	Std. Error	Beta		
1 (Constant)	27.088	4.329		6.257	.000
Digital literacy (attitudes)	.041	.100	.026	.408	.684
Digital literacy (technical)	.689	.184	.340	3.747	.000
Digital literacy (cognitive)	-.062	.563	-.012	-.110	.913
Digital literacy (social-emotional)	.454	.457	.094	.994	.321

Note. a. Dependent Variable = Attitude towards CL

Table 8.
The Results of the Independent Samples T-test for Digital Literacy

	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	
Digital literacy	Equal variances assumed	.013	.910	-.267	208	.79	-.430	1.60
	Equal variances not assumed			-.255	83.08	.79	-.430	1.68

4. Discussion

This research aimed to explore the correlation between Iranian EFL learners' DL and their attitude toward CL in online classrooms. According to the results, there was a significant relationship between the two variables, signifying the positive correlation between technology and learners' learning. Moreover, there was no significant difference between men and women in terms of DL and CL. The study results showed that learners could be more cooperative and feel safer when talking to others and asking for help using technology. They also cared less about making mistakes. These findings are in accordance with Mariah's (2022) study which emphasizes the integration of DL competencies into English as a Foreign Language class through a CL

approach. As Table 7 shows, the Beta value of the DL second construct (.340) was less than 0.05, meaning that 34% of the relationship between the components of DL and attitudes toward CL was predicted by the DL second construct. As the table shows, the other constructs did not significantly contribute to the model

To answer the third research question and find whether DL differed significantly between male and female learners, an independent-samples t-test was run. Among learners, females had a higher mean score (66.17) than men (65.74). To find whether this difference was significant or not, a t-test was run. The results are reported in Table 8. As the results show, there was no significant difference between male and female participants regarding DL ($t = -.267, p = .79$).

Table 6.
Results of the ANOVA Test

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	1984.647	4	496.162	9.283	.000
Residual	10956.919	205	53.448		
Total	12941.567	209			

Note. a. Dependent Variable = Attitude towards CL

b. Predictors = (Constant), DLconstruct4, DLconstruct1, DLconstruct2, DLconstruct3

ownership over learning outcomes as an integral part of digital literacies. Likewise, He and Wray (2017) claim online collaborative work and sharing content through mobile devices are motivating for students to enhance their learning. Ng (2012) asserted that undergraduates could use unfamiliar technologies in their learning to create useful artifacts. It was found that student's DL levels could be improved through explicit teaching and learning regarding ICT integrations. According to Chen et al. (2006), audio conferencing has a significant impact on CL satisfaction for decision-making tasks. Despite those positive perceptions and benefits students experienced from CL, Kim et al. (2005) confirmed that one of the most difficult challenges for students in CL and group work activities is communication. The findings revealed that the students' communication difficulties are due to time zone differences and scheduled meetings in online settings.

5. Conclusion

The present study showed a positive significant correlation between Iranian EFL learners' DL and their attitude towards using CL in online classrooms with no gender-based differences. The results signify that improving the level of DL can increase learners' attitudes toward using CL in online classrooms among EFL learners and participants are more cooperative when using DL and feel safer when talking to others and asking for help. They also feel less anxiety about making mistakes. The results also showed that the technical was the best predictor of learners' attitudes toward CL which highlighted the fact that being able to use technology could help learners develop technical skills, learn copyright and plagiarism rules, understand how to access information online and learn social responsibility when interacting on social networks. Therefore, a severe change is needed in the English classroom, starting with changing the curriculum and employing a proper module to integrate DL to enhance learners' attitude toward CL. Accordingly, the results of the current study can help educators to examine the usefulness of online group task employment in different educational contexts. Furthermore, learners can benefit from these tasks in anxiety-free situations where the class attention is on the whole group to provide positive relationships among learners and the learning community (Slavin & Cooper, 1999). Similarly, the CL can help teachers consider group activities in their classes to enhance learners' thinking and support them in building their understanding of subject matter, and inspire useful communication among students in classes.

In light of these results, several suggestions can be made. First, school administrators may prefer to give teachers more space to use the Internet and digital tools to improve their digital skills. Policymakers should try to equip foreign language teachers with digital tools before and after foreign language teacher training courses so that their digital skills can keep up with the rapidly

changing digital world. They should take advantage of emerging technologies in learning by monitoring the use of the Internet for English language teaching and learning. This could be achieved by providing training programs and workshops. Further research could explore the underlying reasons why students are not sufficiently literate to use DL and CL. This study only examined learners' DL although both students' and teachers' DL may play an important role in enhancing students' learning outcomes. So, future studies need to tackle this issue and provide a deeper understanding of the importance of DL in language learning environment.

Declarations

Competing interest

The authors hereby declare that there are no conflicting interests.

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Authors' contribution

All authors participated equally to conduct the present study.

Availability of data and materials

The manuscript contains all datasets generated and/or analyzed in the current study.

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Appendix A

Digital Literacy Questionnaire adapted from Ng (2012)

Items	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. I like using ICT for learning					
2. I learn better with information and communication technologies (ICT)					
3. ICT makes learning more interesting					
4. I am more motivated to learn with ICT					
5. I frequently obtain help with my university work from my friends over the Internet (e.g., through Skype, Facebook, Blogs)					
6. ICT enables me to be a self-directed and independent learner					
7. I know how to solve my own technical problems					
8. I can learn new technologies easily					
9. I keep up with important new technologies					
10. I know about a lot of different technologies					
11. I have the technical skills I need to use ICT for learning and to create artefacts (e.g., presentations, digital stories, wikis, blogs) that demonstrate my understanding of what I have learned					
12. I am confident with my search and evaluation skills in regard to obtaining information from the Web					
13. There is a lot of potential in the use of mobile technologies (e.g., mobile phones, PDAs, iPods, smartphones etc.) for learning					
14. Teachers/lecturers should use more ICT in their teaching of my classes					
15. ICT enables me to collaborate better with my peers on project work and other learning activities					
16. I have good ICT skills					
17. I am familiar with issues related to web-based activities (e.g., cyber safety, search issues, plagiarism)					