Examination of the Relationship between Digital Literacy and Lifelong Learning Tendencies of Primary School Teachers

Süleyman Erkam Sulak[*a], Seher Çetinkaya[b], Alperen Şükrü Çapanoğlu[c]

[a](ORCID ID: 0000-0003-4042-891X), Ordu University, Turkey, erkamsulak@gmail.com
[b](ORCID ID: 0000-0002-1330-106X), Ordu University, Turkey, sbayat_cetinkaya@hotmail.com
[c](ORCID ID: 0000-0001-5809-9777), Turkish Ministry of Education, alperencapanoglu@gmail.com
[*]Corresponding author

ARTICLE INFO

ABSTRACT

This research aims to examine the relationship between primary school teachers' digital literacy and lifelong learning tendencies. The research sample consists of 153 primary school teachers who were determined via convenience sampling among purposive sampling methods and voluntarily participated in the study. The participants were serving in the province of Ordu, Turkey. Data collection tools used in the study were Personal Information Form, Digital Literacy Scale, and Lifelong Learning Tendency Scale (LLTS). In the analysis of the collected data, Kolmogorov Smirnov and Shapiro Wilk tests, unrelated samples t-test, one-way analysis of variance (ANOVA), Tukey and Games Howell test, Kruskal Wallis, and Pearson Product-Moment Correlation Analysis were used. Research findings demonstrated that the digital literacy of primary school teachers is at the "good" level and lifelong learning tendencies at the "strongly agree" level. Primary school teachers' digital literacy does not differ by the variables of gender and educational status; yet differs significantly by age, seniority, and in-service training. Lifelong learning tendencies differ significantly in favor of women by gender; do not differ according to age, seniority, education level, and in-service training. In addition, a moderately positive correlation was found between the digital literacy and lifelong learning tendencies of primary school teachers.

INTRODUCTION

Sustaining the learning process throughout life is one of the competencies required in the 21st century. Teachers should tend to learn throughout life, like every individual, should be aware of the innovations taking place in education to internalize them and enable learners to reach these competencies. Thus, teachers can be capable of contributing to students' lifelong learning competencies.

Learning is defined as a long-term change or behavioral change in our mental symbols or connections at the end of an experience (Ormrod, 2020). The fact that the learning process is not confined only to schools, and continues throughout life has put the spotlight on the concept of lifelong learning (Sarıgöz, 2020). Lifelong learning activities can emerge by chance outside of a formal educational institution without any plan. For this reason, any continuous and purposeful learning activity aiming to increase knowledge, skills, and competencies, can be addressed as lifelong learning (Kalz, 2015). The main objective of lifelong learning is to help individuals adapt to the society they live in and to better control their social and economic lives. Besides, lifelong learning aims to create the society of the future by raising individuals who constantly learn, research, question, solve problems and improve themselves while providing adults with the opportunity to fulfill their capacities, open their minds, and adapt to innovations by offering them various knowledge and skills (Güneş and Deveci, 2021; Samancı and Ocakcı, 2017).

In today's world, the term lifelong learning is now an integral part of everyday speech in the language of education (Collins, 2009). The dramatic increase of interest in lifelong learning mainly results from social changes derived from information technology. Information produced increase incrementally and technologies are getting more and more complex. The resources provided by information technology, and the internet, in particular, play a key role in enhancing lifelong learning opportunities. The prevalence and strength of these resources will keep increasing (Bosco, 2007). The knowledge-based economy, new technologies, the ever-increasing rate of technological change, and globalization affect the population's needs to brush up on their skills and competencies (Colardyn & Bjornavold, 2004). Technological developments have obliged the acquisition of unconventional skills in the production of knowledge, as well as acquiring, using, and sharing the knowledge produced. Successful individuals of the information society should be those who can learn by themselves and for a lifelong period by resorting to information in every subject (Polat & Odabaş, 2008). Collins (2009) describes the characteristics of a lifelong learner as being curious, entrepreneurial, creative, innovative, motivated to learn, capable of learning from others and sharing, accepting feedback, self-sufficient, learning from previous mistakes, good communication skills, high-level thinking skills, advanced skills in searching and reaching information among others. The way we access information and services is still subject to change. Technical skills solely will not be sufficient to let us master an

entirely new digital world. In the same breath, we need new competencies for a deeper understanding of the opportunities, challenges, and even ethical questions posed by new technologies (Figel, 2007).

Many daily life activities, such as easy access to information and communication are possible with digital technologies (Atakişi & Orhan, 2020). Digital competence is among the most important skills that support lifelong learning, by providing easier access to information. Digital competence encompasses the use of the internet as well as evaluating and producing information (Erdamar et al., 2017). It is considered an important concept to manage the digital identities of individuals securely (Vezne, 2021). The improvement of digital skills and competencies has become a key element on the agenda of academics, practitioners, and policymakers around the globe to ensure full participation of citizens in the increasingly digital society of our day (Iordache et al., 2017). We can discuss digital competence as an element that lays the ground for digital literacy. Digital literacy includes the fruitful use of digital competence under life conditions (Martin & Grudziecki, 2006). Literacy begins when an individual recognizes, reads, and comprehends written signs. Not only reading and writing but also using these skills in daily life has been considered as a way of preparing the individual for social, economic, and civic duties and roles in terms of functional literacy. Today, literacy is compulsory to be able to read the past and write the future (Güneş & Deveci, 2021).

Digital literacy is defined as the ability to read and understand texts in the digital environment with the proliferation of internet technologies in the 1990s. The term was first used in 1997 by Paul Gilster in its current meaning (Koltay, 2011). Digital literacy refers to the awareness, attitude, and ability of individuals to use digital tools appropriately to identify, access to, manage, integrate, evaluate, analyze and synthesize digital resources, create new information and media expressions, and communicate with others (Martin, 2006). Digital literacy is a developmental umbrella term that comprises technical, cognitive, and social-emotional perspectives of learning with digital technologies, both online and offline. Theoretically, a digitally literate person should be able to adapt swiftly to recent and emerging technologies and easily pick up the new semiotic language for communication as they emerge (Ng, 2012). Digital literacy is essential for a successful life in a well-functioning society and is a prerequisite, a tool, and a learning goal for living in a world that is rich in information technology (Gapski, 2007). Digital literacy is beyond the ability to use software or operate a digital device. Instead, it includes a wide range of complex cognitive, motor, sociological and emotional skills that users need to put into use effectively in digital environments. Digital literacy skills can be listed as "photographic-visual skills" including learning and thinking from visuals; "production skills" including creative production from materials such as text, audio, video, pictures; "branching skills" including free navigating between information sources, using and structuring non-organized information; "knowledge acquisition skills" including active seeking and evaluation of information and critical thinking; "socio-emotional skills" including management of emotional and social aspects in the digital environment as well as avoiding traps, viruses and frauds (Eshet-Alkalai, 2004).

Digital literacy is a much broader concept than mastering basic technical and internet search skills (Visser, 2013). Digital literacy encompasses the ability to carry out successful digital actions during work, learning, leisure time under real-life conditions in other aspects of daily life. It is a lifelong process that will change and develop according to the life circumstances of a person. Digital literacy is broader than ICT literacy as well since it includes a variety of literacy elements such as information literacy, media literacy, and visual literacy. It comprises the acquisition and use of knowledge, techniques, attitudes, and personal qualities, as well as the ability to plan, execute and evaluate digital actions in solving tasks in life, and to reflect on one's digital literacy development (Martin, 2006).

In the 21st century, there is a growingly important need to continue education and acquire the skills necessary to adapt to the ever-changing world. We need to keep our skills up to date as lifelong learners to catch up with the rapidly growing and changing world (Laal, Laal, & Aliramaei, 2014; Laal & Salamati, 2012). Longworth(2003) emphasizes the significance of lifelong learning for the 21st century considering global demographics and environmental requirements. In consideration of factors such as widespread access to information via new technologies, the pace of innovation in science and technology, it is becoming more and more imperative to not only equip people with knowledge in educational institutions but also to prepare them to update their knowledge, skills, and competencies and to take responsibility for learning throughout their lives (Kalz, 2015).

Lifelong learning approaches are expected to meet the growing need for enhanced digital competence for students. In primary school education, students should learn how to use digital tools critically, confidently, and creatively, with an emphasis on safety, security, and privacy. This process should be supported by teachers who are equipped with digital competencies. Teacher training should not only focus on ICT use skills. Teacher training and in-service training should develop teachers' digital competencies and enable them to teach this subject (Ala-Mutka et al., 2008). The increasing importance of lifelong learning and the dominance of computers and other technological tools paved the way for the prominence of digital literacy (Özerbaş & Kuralbayeva, 2018). As teachers develop proficiency in technology, they can help students' technical problems without much effort, and thus will not be troubled with the pedagogy and teaching the content that students need to learn. In this way, they will help their students by preparing engaging and relevant activities (Ng, 2011). Besides, the COVID-19 pandemic has required teachers to have digital literacy to implement an up-to-date and innovative education model, making both educational institutions and teachers realize that being digitally skilled is no longer an option but a real necessity (Sanchez-Cruzado et al., 2021)

In the literature, there is a copious of research on lifelong learning (Ayaz, 2016; Bozat et al., 2014; Bulaç & Kurt, 2019; Çelebi et al., 2014; Demir-Başaran & Sesli, 2019; Demirel & Akkoyunlu, 2017; Dündar, 2016; Erdener & Gül, 2017; Evin Gencel, 2013; Gedik, 2019; Gökyer & Karakaya Cirit, 2018; Kazu & Erten, 2016; Özçiftçi & Çakır, 2015; Satıroğlu, 2019; Şahin & Arcagök, 2014; Şahin et al, 2020; Yaman & Yazar, 2015 ; Yıldırım, 2015; Yıldız Durak & Tekin, 2020; Yılmaz, 2016), and digital literacy

or digital competence (Aksoy et al., 2021; Arslan, 2019; Ata & Yıldırım, 2019; Can et al., 2020; Erol & Aydın, 2021; Kara, 2021; Karaoğlan Yılmaz and Binay Eyuboğlu, 2018; Khalid et al., 2015; Korkmaz, 2020; Ocak and Karakuş, 2019; Özerbaş & Öçal, 2019; Özerbaş and Kuralbayeva, 2018; Öztürk & Budak, 2019; Sanchez-Cruzado et al., 2021; Sarıkaya, 2019; Üstündağ et al., 2017; Velez et al., 2017; Yazar & Keskin, 2016; Yontar, 2019; Zahorec et al., 2019). The correlation levels between lifelong learning tendency and digital literacy have been examined only on pre-service teachers (Boyacı, 2019; Özoğlu, 2019; Özoğlu & Kaya, 2021; Ulukaya Öteleş, 2020). There is no study examining the relationship between digital literacy and lifelong learning tendencies of primary school teachers. The education process and teachers being the guides of this process are very important in raising individuals having a desire for lifelong learning and digital literacy skills (Ulukaya Öteleş, 2020). In this regard, primary school teachers take initial steps to acquire children with lifelong learning and digital literacy skills. Therefore, it is believed that a study that will reveal the lifelong learning tendencies and digital literacy levels of primary school teachers will contributory. The relationship between digital literacy levels and lifelong learning tendencies of primary school teachers is important in terms of their adaptation to the society and supporting their students. In addition, it is believed that this study will offer an outlook on the current situation, contribute to the literature, and shed light on teaching activities and stakeholders. In this scope, this research aims to examine the relationship between digital literacy and lifelong learning tendencies of primary school teachers. To this end, following research questions are asked:

1. What are the digital literacy and lifelong learning tendencies of primary school teachers?
2. Does the digital literacy of primary school teachers differ significantly by their gender, age, seniority, education level, and in-service training?
3. Do lifelong learning tendencies of primary school teachers differ significantly by their gender, age, seniority, education level, and in-service training?
4. Is there a relationship between digital literacy and the lifelong learning tendencies of primary school teachers?

METHODOLOGY

Research Model

In this study, the relational survey model, one of the quantitative research designs, was used to examine the relationship between digital literacy and lifelong learning tendencies of primary school teachers. Quantitative research is based on the analysis of quantitative data collected with surveys, scales, and similar data collection tools with various statistical techniques, and its main objective is to generalize the result to the population by explaining the relationship between variables (Ocak, 2019; Tutar & Erdem, 2020).

Survey research refers to the studies that aim to collect data to determine the characteristics of a group. An important advantage of survey research is that offers a lot of information obtained from a very large sample of individuals. Relational survey research, on the other hand, aims to determine the relationships between two or more variables and to obtain clues about cause and effect. The extend of some relationship types is examined. Thus, the phenomenon in question can be better understood by investigating possible relationships. Determination of the relationships also helps make predictions (Büyüköztürk et al., 2017). According to Oral and Çoban (2020), survey research is the description of a variable, situation, or event that exists in nature without making alterations. In relational research, the co-variation of multiple variables is investigated.

Population and Sample

The research population consists of Ordu province in Turkey. The research sample was determined by the convenient sampling method, one of the purposeful sampling methods. The sample group consists of 153 primary school teachers who voluntarily participated in the study and were serving in the 2021-2022 academic year in Ordu. Purposeful sampling allows for in-depth research by selecting information-rich situations depending on the research objective (Büyüköztürk et al., 2017, p.92). In the convenience sampling method, the sample is formed by selecting the items, members, stakeholders, objects that can be studied conveniently. Convenience sampling enables researchers to evaluate the items, objects, elements, or stakeholders within the scope of the research population in terms of being easily accessible and appropriate, thus helping researchers determine the items of the sample (Oral & Çoban, 2020, p.156). Demographic characteristics of the sample group are presented in Table 1.

Table 1. Demographic Characteristics of the Primary School Teachers Participating in the Study

Variable	Groups	*f*	%
Gender	Female	96	62.7
	Male	57	37.3
Age	20-29 years	39	25.5
	30-39 years	53	34.6
	40-49 years	44	28.8
	50 years and above	17	11.1
Seniority	1-5 years	34	22.2

	6-10 years	28	18.3
	11-15 years	28	18.3
	16-20 years	19	12.4
	21 years and above	44	28.8
Education status	Bachelor's	123	80.4
	Graduate	30	19.6
In-Service Training	I did not get.	105	68.6
	Digital Literacy or Lifelong Learning	32	20.9
	Digital Literacy and Lifelong Learning	16	10.5
Total		153	100

As presented in Table 1, 62.7% (n = 96) of the 153 teachers who voluntarily participated in the study are female and 37.3% (n = 57) are male. As for the age groups, 25.5% (n = 29) are in the range of 20-29 years, 34.6% (n = 53) in 30-39 years, 28.8% (n = 44) in 40-49 years, and 11% ,1 (n = 17) in 50 years or above. 22.2% (n = 34) of the participants have 1-5 years of seniority, 18.3% (n = 28) have 6-10 years, 18.3% (n = 28) 11-15 years, and 12.4% (n = 19) 16-20 years, 28.8% (n = 44) have 21 years or above seniority. 80.4% (n = 123) hold bachelor's degree and 19.6% (n = 30) graduate degree. 68.6% (n = 105) of the participants did not have any in-service training while 20.9% (n = 32) received in-service training on digital literacy or lifelong learning, and 10.5% (n = 16) received in-service training on both digital literacy and lifelong learning.

Data Collection Tools and Process

Data collection tools comprise the personal information form used to determine the demographic characteristics of primary school teachers, Digital Literacy Scale developed, tested for reliability and validity by Sulak (2019), and Lifelong Learning Tendency Scale (LLTS) developed by Gür, Erdoğan and Arsal (2016). Data collection tools were implemented through Google Forms due to the restricting pandemic conditions. Primary school teachers were reached via school principals, telephone, mail, or Whatsapp. Feedback was asked while and after the application of the data collection tools whenever possible. Besides, it was noted that data collection tools should be filled in an appropriate time and environment. There are generally five ways to collect data in survey research. The researcher can collect data via the printed form of the data collection tool, use the telephone or mail, collect data over the internet or conduct an interview. The application of the data collection tool over the internet ensures that the data is collected quickly, the participants are not affected by the data collector as they hide their identities, and the data is recorded in the digital environment (Büyüköztürk et al., 2017, pp.188-189).

Personal Information Form: The form was developed by the researcher in order to determine the in-service training status, gender, age, seniority, and educational status of the sample group.

Digital Literacy Scale (DLS): The scale was developed by Sulak (2019) who also conducted validity and reliability studies of the scale. The 5-point Likert scale in three-factor structure (instructional technologies, information, and communication, technique) consists of 44 items. The instructional technologies factor includes items such as "I can use technologies for creating an interactive learning environment (such as Edpuzzle)" and "I can use spreadsheet programs (such as Excel, Calc)." The information and communication factor includes items such as "I can use instant messaging technologies (such as Whatsapp, Line, Skype)" and "I can use e-mail sending/receiving technologies (such as Gmail, Hotmail)." The technical factor includes items such as "I can use word processor programs (such as Word, Writer)" and "I can use presentation technologies (such as PowerPoint, Impress)". Participation levels of the items are none, poor, moderate, good, and very good. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were applied for construct validity. There are 18 items in the first factor and the factor loads of the items are between .367 and .803. The second factor includes 15 items and the factor loads of the items are between .482 and .675. There are 11 items in the third factor and the factor loads of the items are between .509 and .742. According to the results of the reliability analysis, the item-total correlations ranged between .39 and .77 and the total correlations of all items are higher than .30. Cronbach's alpha coefficient was found .92 in the first factor; .90 in the second factor; .91 in the third factor and a high internal consistency was obtained. The lowest score that can be obtained from the scale is (44 x 1) 44, and the highest score (44 x 5) is 220.

Lifelong Learning Tendency Scale (LLTS): This scale was developed by Gür Erdoğan and Arsal (2016). This 5-point Likert scale has 17 items and a two-factor structure (willingness to learn and openness to improvement). In the factor of willingness to learn, there are items such as "I enjoy learning new things" and "I prepare the necessary resources for learning in advance." In the factor of openness to improvement, there are items such as "I make an effort to solve the problems I may encounter in my profession" and "I look for ways to get training to overcome my professional inadequacies". The total explanatory power of the two factors was found at 43.44%. The construct validity was tested with confirmatory factor analysis. The criterion validity of the scale is .71. Cronbach's alpha internal consistency coefficient is .86 and the ω value is .89. The test-retest reliability coefficient for stability is .76. Participation levels of the items are ranged as strongly disagree, disagree, neutral, agree, and strongly agree. The lowest score that can be obtained from the scale (17 x 1) is 17, and the highest (17 x 5) is 85.

As the Digital Literacy Scale and the Lifelong Learning Tendency Scale are 5-point Likert-type scales, cut-off scores were determined based on Uzunboylu and Sarıgöz's (2015) formula as presented in Table 2.

Table 2. Cut-off Scores DLS and LLLT Scale

	Between 1.00-1.80	Between 1.81-2.60	Between 2.61-3.40	Between 3.41-4.20	Between 4.21–5.00
DLS	Too bad	Bad	Moderate	Good	Very good
LLLTS	I strongly disagree	I disagree	Neutral	I agree	I strongly agree

Data Analysis

The data collected were transferred to an Excel program in a computer environment via Google spreadsheet. After it was determined that there were no erroneous or missing data, the data were transferred to the SPSS 26 statistical program. To analyze the data transferred, preliminary studies were carried out to decide which statistical techniques could be used considering the average and total scores obtained from the scale items and factors. The outliers of the digital literacy scale were examined through the z-score and the boxplot. Subjects with the z score less than -3.3 and those demonstrated as outliers in the boxplot were excluded from the data set (Kilmen, 2020). Thus, the number of subjects in the sample fell from 158 to 153.

The normal distribution of the scores obtained from the digital literacy scale and the lifelong learning tendency scale were initially examined. The Shapiro Wilks test was used when the group size was less than 50, and the Kolmogorov Smirnov test was used otherwise. The result of $p > .05$ obtained from these tests is considered to be a convenient result for normal distribution (Büyüköztürk, 2020, p.42). According to the Kolmogorov Smirnov and Shapiro Wilks test results, it was found that the digital literacy scale scores show a normal distribution. Therefore, independent samples t-test was used for two-group variables and the one-way analysis of variance (ANOVA) for independent samples for at least three-group variables. The Kolmogorov Smirnov and Shapiro Wilks test results of the scores of the lifelong learning tendency scale do not show normal distribution. However, since the skewness and kurtosis values of the lifelong learning tendency scale scores were between -1.5 and +1.5, it was considered to be suitable for normal distribution (Tabachnick & Fidell, 2020). For this reason, independent samples t-test was used for two-group variables having these skewness and kurtosis values, and the one-way analysis of variance (ANOVA) was used for independent samples for at least three-group variables. Since the skewness and kurtosis values of each group of the seniority and in-service training variables did not show normal distribution according to the scores of the lifelong learning tendency scale, the Kruskal Wallis test was applied for these variables. In the one-way analysis of variance, the Tukey test was used when variances were equal, and the Games Howell test, which is the most powerful test, was used when variances were not equal (Kilmen, 2020). The effect size ($\eta 2$) was calculated for the cases with statistical differences at the end of the analysis. Descriptive statistics were made to determine the digital literacy and lifelong learning tendency levels of primary school teachers. In addition, Pearson Product-Moment Correlation Coefficient Analysis, which is used to define the linear relationship between two normally distributed continuous variables and to find and interpret the extend of the relationship (Büyüköztürk, 2020; Kilmen, 2020), was used to reveal the relationship between digital literacy and lifelong learning tendency level of primary school teachers.

Table 3. Normality Test Results of the Digital Literacy Scale and Lifelong Learning Tendency Scale

	Kolmogorov Smirnov			Shapiro Wilk		
	Statistics	sd	p	Statistics	sd	p
DLS	.070	153	.062	.987	153	.151
LLLTS	.177	153	.000	.856	153	.000

As presented in Table 3, DLS has a normal distribution. Tabachnick and Fidell's (2020) condition for skewness and kurtosis values to be between -1.5 and +1.5 to conform with normal distribution was taken into account for LLTS (skewness: -1.065 and kurtosis: .229 for LLTS). Therefore, Pearson Product-Moments Correlation Coefficient analysis was applied to reveal the relationship between the two variables.

Ethics of Research

The research titled "Examination of the Relationship Between Digital Literacy and Lifelong Learning Tendencies of Primary School Teachers" was examined by Ordu University Social and Human Sciences Research Ethics Committee and was found ethically appropriate with the decision of 2021-153 dated 04/10/2021.

FINDINGS

Within the scope of the sub-problems of the research, the digital literacy and lifelong learning tendency levels of primary school teachers as well as the relationship between these levels are presented based on various variables.

What are the levels of primary school teachers' digital literacy and lifelong learning tendencies?

The descriptive statistics regarding the first sub-problem of the research, digital literacy and lifelong learning tendencies of primary school teachers, are presented in Table 4 and Table 5. The lowest score that can be obtained from the DLS is (44 x 1) 44, and the

highest (44 x 5) is 220. The lowest score that can be obtained from the LLTS is (17 x 1) 17, and the highest (17 x 5) is 85. Cut-off scores of the scales were determined based on Uzunboylu and Sarıgöz's (2015) formula.

The lowest score that can be obtained from the instructional technologies factor of the Digital Literacy Scale (18 x 1) is 90, the highest (18 x 5) is 90. The lowest score that can be obtained from the information and communication factor (15 x 1) is 15, the highest (15x5) is 75. The lowest score that can be obtained from the technical factor is (11 x 1) 11, and the highest (11 x 5) is 55.

Table 4. Means, Standard Deviation, Minimum and Maximum Scores of the Digital Literacy Scale and Scale Factors

Variable	N	Number of Items	$\bar{X}$	ss	Minimum Score	Maximum Score
Instructional Technologies	153	18	49.37 (2.74)	16.73	20	90
Information and Communication	153	15	68.26 (4.55)	7.55	46	75
Technical	153	11	50.26 (4.56)	6.67	27	55
DLS	153	44	167.90 (3.81)	25.30	102	220

According to the data presented in Table 4, primary school teachers are at a "moderate" level in the instructional technologies factor ($\bar{X}$ = 49.37, sd = 16.73). They were found at "very good level" in information and communication factor ($\bar{X}$ = 68.26, sd = 7.55) and technical factor ($\bar{X}$ = 50.26, sd = 6.67). Digital literacy levels ($\bar{X}$ = 167.90, sd = 25.30) of the teachers were determined as "good". The lowest score that can be obtained from the willingness to learn factor of the Lifelong Learning Tendency Scale is (11 x 1) 11, the highest score (11 x 5) is 55. The lowest score that can be obtained from the openness factor (6 x 1) is 6; the highest (6 x 5) is 30.

Table 5. Mean, Standard Deviation, Minimum and Maximum Scores of Lifelong Learning Tendency Scale and Scale Factors

Variable	N	Number of Items	$\bar{X}$	ss	Minimum Score	Maximum Score
Willingness to Learn	153	11	50.43 (4.58)	4.26	36	55
Openness to Improvement	153	6	27.73 (4.62)	2.89	18	30
LLLTS	153	17	78.16 (4.59)	7.16	57	85

As presented in Table 5, primary school teachers are in the "strongly agree" category in the willingness to learn factor ($\bar{X}$ = 50.43, sd = 4.26) and openness to improvement factor ($\bar{X}$ = 27.73, sd = 2.89). On the other hand, it was determined that the teachers "strongly agree" regarding lifelong learning tendencies ($\bar{X}$ = 78.16, sd = 7.16). Accordingly, it can be suggested that primary school teachers are individuals with a lifelong learning tendency.

Does digital literacy of primary school teachers differ by gender, age, seniority, educational status, and in-service training?

Findings regarding the second sub-question, whether the digital literacy of primary school teachers differs significantly by gender, age, seniority, educational status, and in-service training are listed.
Independent samples t-test was applied to determine whether the Digital Literacy Scale scores of primary school teachers differ by gender. The results are presented in Table 6.

Table 6. Analysis Results of Digital Literacy Scale Scores by Gender Variable

Gender	N	$\bar{X}$	ss	sd	t	p
Female	96	167.26	26.54	151	-.406	.68
Male	57	168.98	23.26			

As presented in Table 6, no significant difference was found between the digital literacy scale mean scores of women ($\bar{X}$ = 167.26, sd = 26.54) and of men ($\bar{X}$ = 168.98, sd = 23.26) [t(151) = -.406, p > .05]. Accordingly, the average scores of the digital literacy scale are in favor of male teachers. Thus, it can be suggested that that the digital literacy of male teachers is better than female teachers.

Digital Literacy Scale scores of teachers by age variable are presented in Table 7.

Table 7. Descriptive Statistics of Digital Literacy Scores by Age Groups

Age	N	$\bar{X}$	ss
20-29 years	39	176.20	19.40
30-39 years	53	170.16	25.79
40-49 years	44	161.13	23.75
50 years and above	17	159.29	33.49

As presented in Table 7, the mean scores of the digital literacy scale decrease as the age increases. Accordingly, the highest mean score is in the 20-29 age group ($\bar{X}$ = 176.20, sd = 19.40), and the lowest in the 50 and above ($\bar{X}$ = 159.29, sd = 33.49). One-way analysis of variance (ANOVA) for independent samples was used to determine whether the digital literacy scale scores of primary school teachers differ by the age variable. Table 8 demonstrates the results of the analysis.

Table 8. ANOVA Results of Digital Literacy Scale Scores by the Age Variable

Source of variance	Sum of Squares	sd	Mean Squares	F	p	Significant Difference
Inter- groups	6234,988	3	2078,329			
In- groups	91126.542	149	611,588	3,398	.019	1 - 3
Total	97361.529	152				

As presented in Table 8, according to the results of the analysis performed to reveal whether the digital literacy scores of primary school teachers differ by four different age groups, a differentiation was found between the mean scores of the age groups [F(3-149) = 3.398, p < .05]. According to the Tukey multiple comparison test results, the mean score of the 20-29 age group ($\bar{X}$ = 176.20, sd = 19.40) in the digital literacy scale is significantly higher than the 40-49 age group ($\bar{X}$ = 161.13, sd = 23.75). Since the calculated η2 value is .06, it can be suggested that 6% of the observed variance depends on the age groups. The observed value (η2 = .06) is moderate (Büyüköztürk, 2020).

Primary school teachers' Digital Literacy Scale scores by the variable of seniority are presented in Table 9.

Table 9. Descriptive Statistics of Digital Literacy Scores by Seniority

Seniority	N	$\bar{X}$	ss
1-5 years	34	175.61	20.77
6-10 years	28	170.35	24.91
11-15 years	28	169.57	24.85
16-20 years	19	171.00	26.78
21 years and above	44	157.97	26.39

As presented in Table, primary school teachers with 1-5 years of seniority ($\bar{X}$ = 175.61, sd = 20.77) have the highest mean score and those who have 21 years and more seniority ($\bar{X}$ = 157.97, ss). = 26.39) have the lowest average score. One-way analysis of variance (ANOVA) was conducted for the independent to reveal whether there is a significant difference in digital literacy of primary school teachers by seniority.

Table 10. ANOVA Results of Digital Literacy Scale Scores by the Seniority Variable

Source of variance	Sum of Squares	sd	Mean Squares	F	p	Significant Difference
Inter- groups	6787,237	4	1696,809			
In- groups	90574.292	148	611.988	2,773	.029	1 - 5
Total	97361.529	152				

As presented in Table 15, the one-way analysis of variance (ANOVA) for independent samples was conducted to determine whether the digital literacy scores of primary school teachers differ by seniority [F(4-148) = 2.773, p < .05]. As a result of the Tukey multiple comparison test, the mean score of the classroom teachers who have 1-5 years of seniority ($\bar{X}$ = 175.61, sd = 20.77) in the digital literacy scale is significantly higher than the mean score of those with a seniority of 21 years and above ($\bar{X}$ = 157.97, sd = 26.39). The calculated value of η2 is .06. Therefore, it can be said that 6% of the observed variance is related to seniority. The observed value (η2 = .06) is moderate (Büyüköztürk, 2020).

Independent samples t-test was applied to determine whether the Digital Literacy Scale scores of primary school teachers differ by their educational status. The analysis result is demonstrated in Table 11.

Table 11. Analysis Results of Digital Literacy Scale Scores by the Educational Status Variable

Education status	N	$\bar{X}$	ss	sd	t	p
Bachelor's	123	168.34	22.54	35,142	.342	.73
Graduate	30	166.06	34.83			

Table 11 demonstrates the t-test results for the educational status variable of the digital literacy scale scores of the teachers. Accordingly, no significant difference was found between the digital literacy scale mean scores of classroom teachers with

bachelor's degree ($\bar{X}$ = 168.34, sd = 22.54) and the scores of those with graduate degree ($\bar{X}$ = 166.06, sd = 34.83) [t(35,142) = .342, p > .05].

Primary school teachers' DLS scores by in-service training variable are presented in Table 12.

Table 12. Descriptive Statistics of Digital Literacy Scores by the In-Service Training Variable

In-Service Training	N	$\bar{X}$	ss
I did not get it.	105	163.51	25.96
Digital Literacy or Lifelong Learning	32	171.18	18.46
Digital Literacy and Lifelong Learning	16	190.12	20.64

As presented in Table 12, primary school teachers who did not get in-service training have the lowest mean scores from the DLS ($\bar{X}$ = 163.51, sd = 25.96). Those who got in-service training on digital literacy and lifelong learning had the highest mean score ($\bar{X}$ = 190.12 sd = 20.64). The results of the one-way analysis of variance (ANOVA) conducted to reveal whether the digital literacy of the teachers differs by the in-service training variable are presented in Table 13.

Table 13. ANOVA Results of Digital Literacy Scale Scores by the In-Service Training Variable

Source of variance	Sum of Squares	sd	Mean Squares	F	p	Significant Difference
Inter- groups	10268,676	2	5134,338			1 – 3
In- groups	87092,854	150	580,619	8,843	.000	2 – 3
Total	97361.529	152				

As can be seen in Table 13, a significant difference was observed in the analysis applied to determine whether the digital literacy scale scores of the teachers differ by their in-service training status [F(2-150) = 8.843, p < .05]. As a result of the Games Howell test (Kilmen, 2020), which is the strongest test to be used when the variances are unequal, the mean scores of the primary school teachers who did not get in-service training from the digital literacy scale ($\bar{X}$ = 163.51, sd = 25.96) are significantly lower than those who got in-service training ($\bar{X}$ = 190.12 sd = 20.64). In addition, DLS mean scores of the who got in-service training on digital literacy and lifelong learning ($\bar{X}$ = 190.12 sd = 20.64) are significantly higher than those who got in-service training either on digital literacy or lifelong learning ($\bar{X}$ = 171.18). ss = 18.46). The η^2 value for this analysis was found as .01. It can be suggested that 1% of the observed variance depends on in-service training. The observed value ($\eta2$ = .01) is low (Büyüköztürk, 2020).

Does the Lifelong Learning Tendency of Primary School Teachers Differ by Gender, Age, Seniority, Educational Status, and In-Service Training?

Findings regarding the third sub-problem of the research, whether the lifelong learning tendencies of primary school teachers differ by gender, age, seniority, educational status, and in-service training are explained below.

Independent samples t-test was applied to determine whether the LLTS scores of the teachers differ by gender. The analysis result is demonstrated in Table 14.

Table 14. Analysis Results of LLTS Scores by the Gender Variable

Gender	N	$\bar{X}$	ss	sd	t	p
Female	96	79.17	6.88	151	2.303	.02
Male	57	76.45	7.36			

Table 14 presents the results of the independent samples t-test, which was conducted to examine whether there is a significant difference between the mean scores of LLTS by the gender variable. Considering the results of the analysis, lifelong learning tendency shows a significant difference by gender [t(151) = 2.303, p < .05]. The lifelong learning tendencies of women ($\bar{X}$ = 79.17, sd = 6.88) are higher than men ($\bar{X}$ = 76.45, sd = 7.36). The calculated value of $\eta2$ is .03. 3% of the variability in the lifelong learning tendencies of primary school teachers is explained by the gender variable.

Primary school teachers' LLTS scores by the age variable are presented in Table 15.

Table 15. Descriptive Statistics of LLTS Scores by Age Groups

Age	N	$\bar{X}$	ss
20-29 years	39	79.48	5.12
30-39 years	53	78.45	6.82
40-49 years	44	77.50	7.98
50 years and above	17	75.94	9.55

As presented in Table 15, it was determined that the LLTS score of the teachers decreases as the age groups increase. Accordingly, the highest mean score is in the 20-29 age group ($\bar{X}$ = 79.48, sd = 5.12), and the lowest mean score is in the 50 and above ($\bar{X}$ =75.94, sd = 9.55). One-way analysis of variance (ANOVA) for independent samples was used to determine whether primary school teachers' LLTS scores by the age variable. Table 16 describes the results of this analysis.

Table 16. ANOVA Results Related to the Age Variable of LLTS Scores

Source of variance	Sum of Squares	*sd*	Mean Squares	*F*	*p*	Significant Difference
Inter- groups	176,098	3	58,699			
In- groups	7626.817	149	51,187	1.147	.332	-
Total	7802.915	152				

Table 16 demonstrates the results of the one-way analysis of variance (ANOVA) was performed to reveal whether the digital literacy scores of the teachers differ by four different age groups. As a result of the analysis, no significant difference was found between the mean scores of the age groups in the LLTS [F(3-149) = 1.147, p > .05].

The Kruskal Wallis test was used to test whether the LLTS scores of the teachers showed a significant difference by the seniority variable. The findings are described in Table 17.

Table 17. Kruskal Wallis Test Results Related to Seniority Variable of LLBTS Scores

Seniority	*N*	Rank Average	*sd*	χ^2	*p*	Significant Difference
1-5 years	34	74.06				
6-10 years	28	85.64				
11-15 years	28	77.02	4	3.724	.445	-
16-20 years	19	87.63				
21 years and above	44	69.17				

As presented in Table 17, it was determined that there was no significant difference between the age groups at the end of the Kruskal Wallis test, which was performed to test whether there was a significant difference in the LLTS scores by seniority [2 = 3.724, p > .05].
Independent samples t-test was applied to determine whether the LLTS scores of primary school teachers differ by their educational status. The analysis result is presented in Table 18.

Table 18. Analysis Results of LLTS Scores by the Educational Status Variable

Education status	*N*	$\bar{X}$	*ss*	*sd*	*t*	*p*
Bachelor's	123	78.54	6.73	151	1,336	.18
Graduate	30	76.60	8.65			

Table 18 presents the t-test results for the education level variable of the LLTS scores of the teachers. Accordingly, no significant difference was found between the LLTS score means of the teachers with bachelor's degree ($\bar{X}$ = 78.54, sd = 6.73) and the LLTS score means ($\bar{X}$ = 76.60, sd = 8.65) of those with graduate level of education [t(151) = 1.336, p > .05].

Table 19 shows the Kruskal Wallis test results regarding whether the LLTS scores of primary school teachers differ by the in-service training variable.

Table 19. Kruskal Wallis Test Results Related to the In-Service Training Variable of LLTS Scores

In-Service Training	*N*	Rank Average	*sd*	χ^2	*p*	Significant Difference
I did not get it.	105	71.42				
Digital Literacy or Lifelong Learning	32	87.27	2	5.555	.062	-
Digital Literacy and Lifelong Learning	16	93.09				

As presented in Table 19, no significant difference was found in the Kruskal-Wallis test analysis performed to compare the lifelong learning tendencies of primary school teachers by their in-service training [2 = 5.555, p > .05]. It was also found that primary school teachers who did not get any in-service training had a lower mean score than those who got in-service training either on digital literacy or lifelong learning. Besides, those who got in-service training only on one of these had a lower mean score than those who got in-service training on both.

Is There a Relationship Between Primary School Teachers' Digital Literacy and Lifelong Learning Tendencies?

Pearson Product-Moments Correlation Coefficient analysis was used to determine the fourth sub-problem of the research, the relationship between digital literacy and the lifelong learning tendency of primary school teachers. Table 20 demonstrates the results of the analysis.

Table 20. Correlation Between Digital Literacy and Lifelong Learning Tendency

		Digital Literacy	Lifelong Learning Tendency
Digital Literacy	r	1	.551[**]
	p		.000
	N	153	153
Lifelong Learning Tendency	r	.551[**]	1
	p	.000	
	N	153	153

[**]. The correlation is significant at the .01 level.

A simple linear correlation analysis was conducted to examine the relationship between digital literacy and lifelong learning tendencies of primary school teachers. Accordingly, a moderately significantly positive correlation was found ($r = .55$, $p < .01$). The correlation coefficient is defined high- when the absolute value is between .70 and 1; moderate- between .70 - .30, low-level between .30 - .00 (Büyüköztürk, 2020, p.32). Considering the coefficient of determination ($r2 = .30$), the change in digital literacy can explain 30% of the change in lifelong learning tendency.

DISCUSSION AND CONCLUSION

Maintaining learning for a lifetime is a concern of education. Teachers will guide lifelong learners to overcome this challenge (Collins, 2009). Lifelong learning strategies must fulfill the growing need for digital competence for all students and professions.
In this research, digital literacy and lifelong learning tendency levels of primary school teachers; whether these levels differ by gender, age, seniority, educational status, and in-service training; and the relationship between digital literacy and lifelong learning tendencies were examined. The findings obtained suggest that the digital literacy of primary school teachers is at a moderate level in terms of instructional technologies; very good in terms of knowledge and communication, and technical levels. Their digital literacy levels are good. Accordingly, primary school teachers are at the moderate level in instructional technologies such as using animation tools, spreadsheet programs, in-class measurement, and evaluation technologies; at a very good level in information and communication aspects such as instant messaging technologies, sharing information obtained with digital technologies, shopping over the internet; and at a very good level in technical aspects such as transferring files between digital technologies, using a USB memory or external disk, and making a webcam connection. Studies reporting similar results in the literature revealed that teachers' digital literacy levels are at moderate level (Aksoy et al., 2021; Arslan, 2019; Ata & Yıldırım, 2019; Can et al., 2020; Erol and Aydın, 2021; Ocak & Karakuş, 2019; Özerbaş & Öçal, 2019; Özoğlu, 2019; Üstündağ et al., 2017; Velez et al., 2017); and at very sufficient levels (Korkmaz, 2020; Öztürk and Budak, 2019). This difference can be affiliated with the time teachers spend on the Internet and computers, or their interest in digital tools and equipment. Those who can integrate or effectively apply educational technologies to the education and training environment are teachers. Thus, they should be able to use educational technologies very well (Özçiftçi & Çakır, 2015). In the study of Velez et al. (2017), it was observed that the digital literacy of teachers is high at the conceptual level, but decreased at the procedural level. It was also reported that they have low proficiency in managing their own identities on the Internet and exhibit low procedural proficiency in situations related to the management of digital identity as well as participating in conflict situations.

Primary school teachers' lifelong learning tendencies are at the "strongly agree" level for willingness to learn and openness to improvement. Accordingly, it was found that the level of "strongly agree" has been reached in lifelong learning tendency as well. It can be suggested that primary school teachers are willing to learn for a lifetime by setting learning goals suitable for their competencies, enjoying learning new things, preferring self-motivation in the learning process; seeking training to overcome their professional inadequacies, needing continuous learning to renew their knowledge due to rapid changes in information and technology, being willing to get training on knowledge and skills in different fields necessary for their personal or professional development, thus they have lifelong learning tendency. The research in the literature also show similar results (Ayaz, 2016; Bozat et al., 2014; Çelebi et al., 2014; Gedik, 2019; Özoğlu, 2019; Satıroğlu, 2019; Ulukaya Öteleş, 2020; Yıldırım, 2015; Yılmaz, 2016). However, Gökyer and Karakaya Cirit (2018) concluded that primary school teachers have a low level of lifelong learning tendency. Therefore, further studies are needed in this field.

Digital literacy of primary school teachers does not show a significant difference by gender. On the other hand, the digital literacy of male teachers was found at a better level than female primary school teachers. According to the studies of Can et al. (2020), Karaoğlan Yılmaz and Binay Eyupoğlu (2018), Özerbaş and Öçal (2019) and Sarıkaya (2019), there is no significant difference by gender. In addition, the digital literacy of men was found to be higher in the studies of Arslan (2019) and Kara (2021). In addition, contrary to the present study, there are studies in the literature reporting a significant difference by gender, yet these studies report similar findings in terms of men's higher digital literacy (Boyacı, 2019; Korkmaz, 2020; Öztürk & Budak, 2019; Özerbaş & Kuralbayeva, 2018; Özoğlu, 2019; Özoğlu & Kaya, 2021; Ulukaya Öteleş, 2020; Yazar & Keskin, 2016; Yontar, 2019). The high level of digital literacy of male teachers may result from the interest in digital tools differing by gender.

Primary school teachers' digital literacy differs significantly by age. This significant difference was observed between the 20-29 age group and the 40-49 age group. It was also observed that as the age groups of primary school teachers increase, their digital literacy decreases. Accordingly, it can be suggested that young primary school teachers have higher digital literacy. In the study of Aksoy et al. (2021) and Korkmaz (2020), there is a significant difference by age. Accordingly, digital literacy levels decrease as age increases. In the studies of Boyacı (2019), Erol and Aydın (2021), Karaoğlan Yılmaz and Binay Eyupoğlu (2018), significant difference was found by age.   It can be concluded that there is a significant difference in digital literacy by age, and digital literacy levels decrease as age increases.

Primary school teachers' digital literacy differs significantly by seniority. This difference is between primary school teachers with 1-5 years of seniority and those with 21 years and above of seniority. It has been concluded that the digital literacy of classroom teachers with 1-5 years of seniority is significantly higher than the digital literacy of classroom teachers with a seniority of 21 years and above. Accordingly, it can be concluded that primary school teachers with less seniority have higher digital literacy. Research in the literature are in parallel with these results (Aksoy et al., 2021; Erol & Aydın, 2021; Korkmaz, 2020; Özerbaş & Öçal, 2019). It can be concluded that the seniority of teachers adversely affects their digital literacy. Teachers' being at a better level in this sense can be interpreted as a promising situation for the future.

Primary school teachers' digital literacy does not show a significant difference by their educational status. While Arslan's (2019), and Yazar and Keskin's (2016) studies show similarities with this finding, a difference was observed in terms of education status in Aksoy et al.'s (2021) and Korkmaz's (2020) studies. The improvement of teachers' digital literacy is disrupted by the lack of training time allocated for digital literacy, the lack of a culture of promotion for the adequacy of information and technology integration, and the lack of both access to resources and technical support. From a collective perspective, technology-rich activities for interactive learning can lift these barriers (Khalid et al., 2015).

Primary school teachers' digital literacy differs significantly by their in-service training. These differences were found between those who did not receive in-service training and those who received in-service training on only one of the subjects of digital literacy or lifelong learning, and between those who received in-service training on both digital literacy and lifelong learning and those who received in-service training from only one of the subjects. Accordingly, the digital literacy of primary school teachers who did not get in-service training on digital literacy and lifelong learning was lower than those who got in-service training on only one of them. Besides, those who got in-service training in only one of these areas had lower scores than those who got in-service training from both. Considering these results, it can be suggested that lifelong learning and/or in-service training on digital literacy contributes to digital literacy. In Kara's (2021) study, a significant difference was found in favor of those who got digital literacy education. Karaoğlan Yılmaz and Binay Eyupoğlu (2018)'s study differs from the findings of the present study. It is very useful for institutions, which provide continuous in-service training to teachers, monitor and respond to current training needs, and offer teachers adequate study programs or further education courses (Zahorec et al., 2019).

Primary school teachers' lifelong learning tendencies show a significant difference by gender. The lifelong learning tendencies of female teachers are significantly higher than male teachers. There are similar studies reporting a significant difference in favor of women by gender (Boyacı, 2019; Bulaç & Kurt, 2019; Çelebi et al., 2014; Evin Gencel, 2013; Gökyer & Karakaya Cirit, 2018; Kazu & Erten, 2016; Özçiftçi & Çakır, 2015; Özoğlu, 2019; Özoğlu and Kaya, 2021; Satıroğlu, 2019; Şahin et al., 2020; Ulukaya Öteleş, 2020). There are also significant differences by gender as reported by Demir- Başaran and Sesli (2019), Demirel and Akkoyunlu (2017), and Erdener and Gül (2017). There are also studies reporting no significant difference by gender, but that the tendency for lifelong learning is in favor of women (Ayaz, 2016; Dündar, 2016; Karaoğlan Yılmaz & Binay Eyupoğlu, 2018; Yaman & Yazar, 2015; Yıldız Durak & Tekin, 2020). Şahin and Arcagök (2014) and Yılmaz (2016) reported no significant difference by gender, but the tendency for lifelong learning was found in favor of men. Bearing these results in mind, it is concluded that female teachers are more likely to have lifelong learning tendencies than male teachers.

Primary school teachers' lifelong learning tendencies do not show a significant difference by age groups, yet lifelong learning tendency scores decrease as age groups increase. Accordingly, it can be suggested that young primary school teachers have a higher tendency towards lifelong learning. In the literature, some studies have reported significant differences by age (Boyacı, 2019; Gedik, 2019) and some studies report no significant difference (Bozat et al., 2014; Yıldız Durak and Tekin, 2020). Learning should continue throughout life. A high level of lifelong learning tendencies of teachers of all ages is a desirable result.

Primary school teachers' lifelong tendencies do not show a significant difference by their professional seniority and educational status. Similar findings were reported in the study of Gedik (2019), and Kazu and Erten (2016). The studies of Çelebi et al. (2014), Şahin and Arcagök (2014), and Yaman & Yazar (2015) differ from these results. In the study of Ayaz (2016) and Demir-Basaran & Sesli (2019), no significant difference was found by seniority, yet a significant difference was found by educational status. In the study of Bozat et al. (2014), a significant difference was found by seniority. In Yılmaz's (2016) study, a significant difference was found by seniority, yet no significant difference was found by educational status. In this regard, it is difficult to formulate an idea about the effect of teachers' professional seniority and education status on their life-long learning tendencies. However, teachers with lifelong learning skills, regardless of their professional seniority, should always strive to improve themselves, research and follow new technologies, educational approaches, and use them for more effective teaching to better prepare students for life (Yıldız Durak & Tekin, 2020).

The lifelong learning tendencies of primary school teachers do not differ significantly by their in-service training. However, those who did not get in-service training had a lower mean score compared to those who received in-service training on either digital literacy or lifelong learning. Besides, those who got in-service training on either digital literacy or lifelong learning had a lower mean score compared to those who got in-service training on both. Accordingly, it can be noted that receiving in-service training on lifelong learning and/or digital literacy contributes to the lifelong learning tendency. Similar results are found in the literature (Karaoğlan Yılmaz & Binay Eyupoğlu, 2018; Yıldız Durak & Tekin, 2020).

It was found that there is a positive and moderate relationship between primary school teachers' digital literacy and lifelong learning tendencies. There are parallel findings in the literature (Boyacı, 2019; Ulukaya Öteleş, 2020). In addition, some studies do not find a relationship between digital literacy and lifelong learning tendency (Özoğlu, 2019; Özoğlu & Kaya, 2021) and that report a low level of positive relationship (Karaoğlan Yılmaz & Binay Eyuboğlu, 2018). Lifelong learning also includes digital competencies. Considering that digital competence is the basis of digital literacy, and digital literacy is the ability to successfully use digital competence in life situations (Martin & Grudziecki, 2006), there is likely a positive relationship between lifelong learning and digital literacy.

Suggestions based on the results and limitations of the study are listed as follows:
1. It was found that the digital literacy of primary school teachers is at a moderate level in instructional technologies. Accordingly, in-service training and public education activities can be increased specifically for instructional technologies.
2. As a result of the research, digital literacy levels of female teachers were found to be lower compared to men; of those with a higher age compared to young people, and of those with more seniority compared to those with less. Seminars can be organized for female teachers, elder teachers, and those with more years of seniority to raise awareness about digital literacy being among the indispensable skills of today.
3. This research reports that receiving in-service training on lifelong learning and digital literacy contributes to digital literacy. Primary school teachers can be encouraged to receive in-service training on these issues.
4. According to the results of the research, the lifelong learning tendencies of women are significantly higher than men. In addition, as the age groups increase, the lifelong learning tendencies of primary school teachers decrease. For this reason, awareness-raising activities can be carried out for men and older teachers about lifelong learning.
5. In the research, it was observed that the lifelong learning tendency increases by receiving in-service training on digital literacy and lifelong learning. For this reason, to increase the lifelong learning tendency, primary school teachers can be encouraged to take in-service training on these issues.
6. This research is quantitative. Through qualitative research, different studies can be conducted on primary school teachers' lifelong learning activities and digital literacy knowledge levels.
7. The research is confined only to the Ordu sample. In different samples, further research can be conducted on digital literacy and lifelong learning tendency levels, and the relationship between them regarding primary school teachers or other branch teachers. The levels and opinions of the faculty members of education faculties on these issues can also be investigated. Besides, this research is confined only to 153 primary school teachers. In this regard, further research can be conducted with larger samples.
8. Various research can be conducted on how teachers' lifelong learning tendencies and digital literacy can be improved, what kind of program can be prepared, and to whom it should be applied more.

Ethics Committee Approval Information: Ethics committee approval for this study was received from the Ethics Committee of Ordu University (Date: November 04, 2021; Approval Number: 2021/153).

REFERENCES

Aksoy, N. C., Karabay, E., & Aksoy, E. (2021). Sınıf Öğretmenlerinin Dijital Okuryazarlık Düzeylerinin İncelenmesi. *Selçuk İletişim Dergisi, 14(2)*, 859-894. https://doi.org/10.18094/josc.871290

Ala-Mutka, K., Punie, Y., & Redecker, C. (2008). *Digital Competence for Lifelong Learning. Policy Brief.* European Communities.

Arslan, S. (2019). İlkokullarda ve Ortaokullarda Görev Yapan Öğretmenlerin Dijital Okuryazarlık Düzeylerinin Çeşitli Değişkenler Açısından İncelenmesi . *Yüksek Lisans Tezi*. Sakarya: Sakarya Üniversitesi Eğitim Bilimleri Enstitüsü.

Ata, R., & Yıldırım, K. (2019). Exploring Turkish Pre-Service Teachers' Perceptions and Views of Digital Literacy. *Education Sciences, 9(40)*, 2-16. https://doi.org/10.3390/educsci9010040

Atakişi, B., & Orhan, Ş. F. (2020). Orta Yaş ve Üstü Yetişkinlerin Günlük Yaşamda İnternet Kullanma Durumlarının İncelenmesi. *YILDIZ Journal of Educational Research, 5(1)*, 1-26.

Ayaz, C. (2016). Öğretmenlerin Yaşam Boyu Öğrenme Eğilimlerinin Bazı Değişkenler Açısından İncelenmesi (Mardin İli Örneği). *Yüksek Lisans Tezi*. Bartın: Bartın Üniversitesi Eğitim Bilimleri Enstitüsü.

Bosco, J. (2007). Lifelong Learning: What? Why? How? https://www.researchgate.net/publication/251555006

Boyacı, Z. (2019). Öğretmen Adaylarının Yaşam Boyu Öğrenme Eğilimleri ile Dijital Okuryazarlık Düzeyleri Arasındaki İlişki (Düzce Üniversitesi Örneği). *Yüksek Lisans Tezi*. Sakarya: Sakarya Üniversitesi Eğitim Bilimleri Enstitüsü.

Bozat, P., Bozat, N., & Hürsen, Ç. (2014). The Evaluation of Competence Perceptions of Primary School Teachers for the Lifelong Learning Approach. *Procedia - Social and Behavioral Sciences, 140(22)*, 476-482. https://doi.org/10.1016/j.sbspro.2014.04.456

Bulaç, E., & Kurt, M. (2019). Öğretmen Adaylarının Yaşam Boyu Öğrenme Eğilimlerinin İncelenmesi. *Amasya Üniversitesi Eğitim Fakültesi Dergisi, 8(1)*, 125-161. https://dergipark.org.tr/tr/pub/amauefd/issue/45794/532829

Büyüköztürk, Ş. (2020). *Sosyal Bilimler İçin Veri Analizi El Kitab İstatistik, Araştırma Deseni SPSS Uygulamaları ve Yorum (28. Baskı)*. Pegem Akademi Yayıncılık.

Büyüköztürk, Ş., Kılıç Çakmak, E., Akgün, Ö. E., Karadeniz, Ş., & Demirel, F. (2017). *Bilimsel Araştırma Yöntemleri (23.Baskı)*. Ankara: Pegem Akademi.

Can, Ş., Çelik, B., & Çelik, C. (2020). Fen Bilgisi Öğretmen Adaylarının Dijital Okuryazarlık Düzeyine Çeşitli Değişkenlerin Etkisi. *Eğitim Kuram ve Uygulama Araştırmaları Dergisi, 6(3)*, 352-358.

Colardyn, D., & Bjornavold, J. (2004). Validation of Formal, Non-Formal and Informal Learning: policy and practices in EU Member States. *European Journal of Education, 39(1)*, 69-89. https://doi.org/10.1111/j.0141-8211.2004.00167.x

Collins, J. (2009). Lifelong Learning in the 21st Century and Beyond. *RadioGraphics, 29(2)*, https://doi.org/10.1148/rg.292085179

Çelebi, N., Özdemir, H., & Eliçin, Ö. (2014). Studying Level of Awareness of Teachers in terms of Their Lifelong Learning Skills. *Procedia - Social and Behavioral Sciences, 116(21)*, 2030-2038. https://doi.org/10.1016/j.sbspro.2014.01.515

Demir-Başaran, S., & Sesli, Ç. (2019). Examination of Primary School and Middle School Teachers' Lifelong Learning Tendencies Based on Various Variables. *European Journal of Educational Research, 8(3)*, 729-741. https://doi.org/10.12973/eu-jer.8.3.729

Demirel, M., & Akkoyunlu, B. (2017). Prospective teachers' lifelong learning tendencies and information literacy self-efficacy. *Educational Research and Reviews, 12(6)*, 329-337. https://doi.org/10.5897/ERR2016.3119

Dündar, H. (2016). Sınıf Öğretmeni Adaylarının Yaşam Boyu Öğrenme Eğilimlerinin İncelenmesi. *Yüksek Lisans Tezi*. Erzurum: Atatürk Üniversitesi Eğitim Bilimleri Enstitüsü.

Erdamar, G., Demirkan, Ö., Saraçoğlu, G., & Alpan, G. (2017). Lise Öğretmenlerinin Yaşam Boyu Öğrenme Eğilimleri ve Eğitsel İnternet Kullanma Öz-yeterlilik İnançları. *Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi, 17(2)*, 636-657. https://doi.org/10.17240/aibuefd.2017.17.30227-326590

Erdener, M. A., & Gül, Ö. (2017). İlkokul Öğretmenlerinin Yaşam Boyu Öğrenmeye İlişkin Görüşlerinin İncelenmesi. *Necatibey Eğitim Fakültesi Elektronik Fen ve Matematik Eğitimi Dergisi, 11(2)*, 545 - 563. https://doi.org/10.17522/balikesirnef.373445

Erol, S., & Aydın, E. (2021). Digital Literacy Status of Turkish Teachers. *International Online Journal of Educational Sciences, 13(2)*, 620-633. https://doi.org/10.15345/iojes.2021.02.020

Eshet-Alkalai, Y. (2004). Digital Literacy: A Conceptual Framework for Survival. *Journal of Educational Multimedia and Hypermedia, 13(1)*, 93-106.

Evin Gencel, İ. (2013). Öğretmen Adaylarının Yaşam Boyu Öğrenme Yeterliklerine Yönelik Algıları. *Eğitim ve Bilim, 38(170)*, 237-251.

Figel, J. (2007). Key competences for lifelong learning-European reference framework. *Luxembourg: Office for Official Publicatios of the European Communities*, https://www.erasmusplus.org.uk/file/272/download

Gapski, H. (2007). Some Reflections on Digital Literacy. https://www.researchgate.net/publication/221549674. researchgate.net

Gedik, G. (2019). Sınıf Öğretmenlerinin Yaşam Boyu Öğrenme Eğilimlerinin İncelenmesi (Manisa-Demirci İlçesi Örneği). *Yüksek Lisans Tezi*. Manisa: Manisa Celal Bayar Üniversitesi Sosyal Bilimler Enstitüsü.

Gökyer, N., & Karakaya Cirit, D. (2018). Sınıf Öğretmenlerinin Yaşam Boyu Öğrenme Eğilimleri. *Turkish Studies Socail Sciences, 13(18)*, 649-660. http://dx.doi.org/10.7827/TurkishStudies.13927

Güneş, F., & Deveci, T. (2021). *Yetişkin Eğitimi ve Hayat Boyu Öğrenme (5. Baskı)*. Pegem Akademi Yayıncılık.

Gür Erdoğan, D., & Arsal, Z. (2016). The Development of Lifelong Learning Trends Scale (LLLTS). *Sakarya University Journal of Education, 6(1)*, 114-122. http://dx.doi.org/10.19126/suje.32361

Iordache, C., Mariën, I., & Baelden, D. (2017). Developing Digital Skills and Competences: A Quick-Scan Analysis of 13 Digital Literacy Models. *Italian Journal of Sociology of Education, 9(1)*, 6-30. https://doi.org/10.14658/pupj-ijse-2017-1-2

Kalz, M. (2015). Lifelong Learning and Its Support with New Technologies. *International Encyclopedia of the Social & Behavioral Sciences (Second Edition), 14*, 93-99. https://doi.org/10.1016/B978-0-08-097086-8.92006-3

Kara, S. (2021). Öğretmen Adaylarının Dijital Okuryazarlık Düzeyleri ile Web Ortamında Bilgi Arama ve Yorumlama Stratejileri Arasındaki İlişkinin İncelenmesi. *Yüksek Lisans Tezi*. Konya: Necmettin Erbakan Üniversitesi Eğitim Bilimleri Enstitüsü.

Karaoğlan Yılmaz, F. G., & Binay Eyuboğlu, F. A. (2018). Öğretmenlerin Yaşam Boyu Öğrenme Tutumları, Dijital Yerli Olma Durumları ve Teknoloji Kabulü Arasındaki İlişkinin Birbirleri ile ve Çeşitli Değişkenler Açısından İncelenmesi. *Uluslararası Eğitim Bilim ve Teknoloji Dergisi, 4(1)*, 1-17. https://dergipark.org.tr/tr/pub/uebt/issue/37056/397202

Kazu, İ. Y., & Erten, P. (2016). Öğretmenlerin Yaşam Boyu Öğrenme Yeterlikleri. *İlköğretim Online, 15(3)*, 838-854. http://dx.doi.org/10.17051/io.2016.07530

Khalid, M. S., Slættalíð, T., Parveen, M., & Hossain, M. S. (2015). A systematic review and meta-analysis of teachers' development of digital literacy. In E. K. Sorensen, A. Szucs, & M. S. Khalid (Eds.), Proceedings of the 1th D4|Learning international Conference Innovations in Digital Learning for Inclusion (D4Learning, 2015) (pp. 136-144). Aalborg Universitetsforlag.

Kilmen, S. (2020). *Eğitim Araştırmacıları İçin SPSS Uygulamalı İstatistik (3. Baskı)*. Anı Yayıncılık.

Koltay, T. (2011). The Media and The Literacies: Media Literacy, İnformation Literacy, Digital Literacy. *Media, Culture & Society ,33(2)*, 211-221. https://doi.org/10.1177/0163443710393382

Korkmaz, M. (2020). Sınıf Öğretmenlerinin Dijital Okuryazarlık Seviyelerinin Belirlenmesi. *Yüksek Lisans Tezi*. Eskişehir: Eskişehir Osmangazi Üniversitesi Eğitim Bilimleri Enstitüsü.

Laal, M., & Salamati, P. (2012). Lifelong learning; why do we need it? *Procedia - Social and Behavioral Sciences, 31*, 399–403. https://doi.org/10.1016/j.sbspro.2011.12.073

Laal, M., Laal, A., & Aliramaei, A. (2014). Continuing education; lifelong learning. *Procedia - Social and Behavioral Sciences, 116(21)*, 4052 - 4056. https://doi.org/10.1016/j.sbspro.2014.01.889

Longworth, N. (2003). *Lifelong Learning in Action: Transforming Education in the 21st Century.* Routledge.

Martin, A. (2006). A European Framework for Digital Literacy. *Nordic Journal of Digital Literacy, 1*, 151-161.

Martin, A., & Grudziecki, J. (2006). DigEuLit: Concepts and Tools for Digital Literacy. *Innovation in Teaching and Learning in Information and Computer Sciences, 5(4)*, 249-267. https://doi.org/10.11120/ital.2006.05040249

Ng, W. (2011). Why Digital Literacy Is Important for Science Teaching and Learning. *Teaching Science, 57 (4)*, 26-32. http://www.curriculum.edu.au/leader/%20why_digital_literacy_is_important_for_science_teac,34913.html?issueID=12610

Ng, W. (2012). Can We Teach Digital Natives Digital Literacy? *Computers & Education, 59(3)*, 1065-1078. https://doi.org/10.1016/j.compedu.2012.04.016

Ocak, G. (2019). *Eğitimde Bilimsel Araştırma Yöntemleri.* Pegem Akademi Yayıncılık.

Ocak, G., & Karakuş, G. (2019). Öğretmen Adaylarının Dijital Okuryazarlık Öz-yeterlilik Becerilerinin Farklı Değişkenler Açısından İncelenmesi. *Afyon Kocatepe Üniversitesi Sosyal Bilimler Dergisi, 21(1)*, 129-147. https://doi.org/10.32709/akusosbil.466549

Oral, B., & Çoban, A. (2020). *Kuramdan Uygulamaya Eğitimde Bilimsel Araştırma Yöntemleri.* Pegem Akademi Yayıncılık.

Ormrod, J. E. (2020). *Öğrenme Psikolojisi (6. Baskı).* Çev. Ed. M. Baloğlu.: Nobel.

Özçiftçi, M., & Çakır, R. (2015). Öğretmenlerin Yaşam Boyu Öğrenme Eğilimleri ve Eğitim Teknolojisi Standartları Özyeterliliklerinin İncelenmesi. *Eğitim Teknolojisi Kuram ve Uygulama, 5(1)*, 1-19. https://doi.org/10.17943/etku.57410

Özerbaş, M. A., & Kuralbayeva, A. (2018). Türkiye ve Kazakistan Öğretmen Adaylarının Dijital Okuryazarlık Düzeylerinin İncelenmesi. *Muğla Sıtkı Koçman Üniversitesi Eğitim Fakültesi Dergisi, 5(1)*, 16-25. https://doi.org/10.21666/muefd.314761

Özerbaş, M. A., & Öçal, F. N. (2019). Digital Literacy Competence Perceptions of Classroom Teachers and Parents Regarding Themselves and Parents' Own Children. *Universal Journal of Educational Research, 7(5)*, 1255-1264. https://doi.org/10.13189/ujer.2019.070511

Özoğlu, C. (2019). Öğretmen Adayların Yaşam Boyu Öğrenme Eğilimlerinin Dijital Okuryazarlıkları ile İlişkisi (Anadolu Üniversitesi Eğitim Fakültesi Örneği). *Yüksek Lisans Tezi.* Eskişehir: Anadolu Üniversitesi Eğitim Bilimleri Enstitüsü.

Özoğlu, C., & Kaya, E. (2021). Z Kuşağı Öğretmen Adaylarının Yaşam Boyu Öğrenmeleri ve Dijital Okuryazarlıkları Arasındaki İlişki. *Anadolu Journal of Educational Sciences International, 11(1)*, 415-437. https://doi.org/10.18039/ajesi.824040

Öztürk, Y., & Budak, Y. (2019). Öğretmen Adaylarının Kendilerine Yönelik Dijital Okuryazarlık Değerlendirmelerinin İncelenmesi . *Kesit Akademi Dergisi, (21)*, 156-172. https://dergipark.org.tr/tr/pub/kesitakademi/issue/59817/863676

Polat, Ç., & Odabaş, H. (2008, Mart). Bilgi Toplumunda Yaşam Boyu Öğrenmenin Anahtarı: Bilgi Okuryazarlığı. *In Küreselleşme, Demokratikleşme ve Türkiye Uluslararası Sempozyumunda sunulan bildiri.* Akdeniz Üniversitesi: Antalya.

Samancı, O., & Ocakcı, E. (2017). Hayat Boyu Öğrenme. *Bayburt Eğitim Fakültesi Dergisi, 12(24)*, 711-722. https://dergipark.org.tr/tr/pub/befdergi/issue/33599/351270

Sanchez-Cruzado, C., Campion, R. S., & Sanchez-Compana, M. T. (2021). Teacher Digital Literacy: The Indisputable Challenge after COVID-19. *Sustainability, 13(4)*, 3-29. https://doi.org/10.3390/su13041858

Sarıgöz, O. (2020). *Yaşam Boyu Öğrenme.* Anı Yayıncılık.

Sarıkaya, B. (2019). Türkçe Öğretmeni Adaylarının Dijital Okuryazarlık Durumlarının Çeşitli Değişkenler Açısından Değerlendirilmesi. *Uluslararası Sosyal Araştırmalar Dergisi, 12(62)*, 1098-1107. http://dx.doi.org/10.17719/jisr.2019.3122

Satıroğlu, N. S. (2019). Sınıf Öğretmeni Adaylarının Yaşam Boyu Öğrenme Eğilimlerinin Farklı Değişkenler Açısından İncelenmesi. *Yüksek Lisans Tezi.* Erzincan: Erzincan Binali Yıldırım Üniversitesi Sosyal Bilimler Enstitüsü.

Sulak, S. E. (2019). Dijital Okuryazarlık Ölçeğinin Geliştirilmesi: Geçerlik ve Güvenirlik Çalışması. *International Social Sciences Studies Journal, 5(31)*, 1329-1342. http://dx.doi.org/10.26449/sssj.1345

Şahin, Ç., & Arcagök, S. (2014). Öğretmenlerin Yaşam Boyu Öğrenme Yeterlikleri Düzeyinin Çeşitli Değişkenler Açısından İncelenmesi. *Adıyaman Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, (16)*, 394 - 417. https://doi.org/10.14520/adyusbd.705

Şahin, Ü., Sarıtaş, E., & Çatalbaş, G. (2020). Sınıf Öğretmeni Adaylarının Yaşam Boyu Öğrenme Eğilimleri. *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi, 48*, 374-389. https://doi.org/10.9779/pauefd.572500

Tabachnick, B. G., & Fidell, L. S. (2020). *Çok Değişkenli İstatistiklerin Kullanımı (6. Basım).* (Çev. Ed. M. Baloğlu). Nobel Akademik Yayıncılık.

Tutar, H., & Erdem, A. T. (2020). *Örnekleriyle Bilimsel Araştırma Yöntemleri ve -SPSS Uygulamaları-.* Seçkin Yayıncılık.

Ulukaya Öteleş, Ü. (2020). A Study On The Examination Of The Relationship Between Lifelong Learning Tendency and Digital Literacy Level. *European Journal of Education Studies, 7(8)*, 57-73. http://dx.doi.org/10.46827/ejes.v7i8.3185

Uzunboylu, H., & Sarıgöz, O. (2015). The Evaluation of Anthropological Attitudes Towards Social Professional and Lifelong Learning in Terms of Some Veriables. *The Anthropologist, 21(3)*, 439-449. https://doi.org/10.1080/09720073.2015.11891833

Üstündağ, M. T., Güneş, E., & Bahçivan, E. (2017). Turkish Adaptation of Digital Literacy Scale and Investigating Pre-service Science Teachers' Digital Literacy. *Journal of Education and Future, (12)*, 19-29.

Vélez, A. P., Olivencia, J. J., & Zuazua, I. I. (2017). The Role of Adults in Children Digital Literacy. *Procedia - Social and Behavioral Sciences, 237(21)*, 887-892. https://doi.org/10.1016/j.sbspro.2017.02.124

Vezne, R. (2021). Anahtar Yeterlilikler Mi Temel Yeterlilikler Mi? Yeterlilikler ve Hayat Boyu Öğrenme Fırsatları. M. Sarıtepeci, & H. Yıldız Durak içinde, *Dijital Çağda Hayat Boyu Öğrenme* (s. 29-49). Pegem Akademi Yayıncılık.

Visser, M. (2013). Digital Literacy and Public Policy through the Library Lens. *Maine Policy Review, 22(1)*, 104-113. https://digitalcommons.library.umaine.edu/mpr/vol22/iss1/27/

Yaman, F., & Yazar, T. (2015). Öğretmenlerin Yaşam Boyu Öğrenme Eğilimlerinin İncelenmesi (Diyarbakır İli Örneği). *Kastamonu Eğitim Dergisi, 23(4)*, 1553-1566. https://dergipark.org.tr/tr/pub/kefdergi/issue/22597/241367

Yazar, T., & Keskin, İ. (2016). Öğretmen Adaylarının Yaşam Boyu Öğrenme Bağlamında Dijital Yeterliklerinin İncelenmesi. *Uluslararası Eğitim Programları ve Öğretim Çalışmaları Dergisi, 6(12)*, 133-149.

Yıldırım, Z. (2015). Sınıf Öğretmenlerin Yaşam Boyu Öğrenmeye Yönelik Yeterlik Algıları ve Görüşleri. *Yüksek Lisans Tezi.* Çanakkale: Çanakkale Onsekiz Mart Üniversitesi Eğitim Bilimleri Enstitüsü.

Yıldız Durak, H., & Tekin, S. (2020). Öğretmenlerin Hayat Boyu Öğrenme Yeterliliklerinin Kişisel ve Mesleki Değişkenlere göre İncelenmesi. *Bolu Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi, 20(1)*, 221-235. https://doi.org/10.17240/aibuefd.2020.20.52925-547041

Yılmaz, M. (2016). Öğretmenlerin Yaşam Boyu Öğrenme Eğilimlerinin İncelenmesi. *Mustafa Kemal Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 13(35)*, 253-262. https://dergipark.org.tr/tr/pub/mkusbed/issue/24546/259995

Yontar, A. (2019). Öğretmen Adaylarının Dijital Okuryazarlık Düzeyleri. *Ana Dili Eğitimi Dergisi, 7(4)*, 815-824. https://doi.org/10.16916/aded.593579

Zahorec, J., Haskova, A., & Munk, M. (2019). Teachers' Professional Digital Literacy Skills and Their Upgrade. *European Journal of Contemporary Education, 8(2)*, 378-393.