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Research Paper

# Determining the Digital Literacy Levels of Primary School Teachers

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**ABSTRACT**

The primary purpose of this research was to determine the digital literacy proficiency perceptions of primary school teachers working in Eskisehir and compare them based on certain variables. The mixed method was used as a research method; the data were collected using the Digital Literacy Assessment Scale developed by Acar (2015) for quantitative findings and in-depth interviews for qualitative results. The quantitative study group consisted of 733 primary school teachers. In the qualitative dimension of the research, there were data from 7 primary school teachers who agreed to fill out the structured interview form and then take part in an in-depth interview. Quantitative data of the study were analyzed using SPSS software. Qualitative data were analyzed with the descriptive analysis method and interpreted according to their relationship with the research questions. The result showed that the primary school teachers perceive themselves as highly sufficient in regard to the different competence areas of digital literacy and that they dominate these competence areas to a great extent. There were significant differences between the digital literacy levels of the primary school teachers and their age, gender, educational status, seniority in the profession, personal computer possession, constant internet connection, technologies/practices used in education, and technological education. However, the grade level taught was not an influential factor in their digital literacy levels. Moreover, in-service training should be organized to provide digital literacy, using Web 2.0 tools, and integrating technology into the classroom environment, starting with those who have more service than their years of seniority in the profession.



## INTRODUCTION

Literacy is seen as one of the essential criteria that determines one's status in society. However, in the most general sense, literacy requires a learning process that is not only related to the field of writing but also includes visual and/or audio media. In this context, computer literacy, technology literacy, and e-literacy have been diversifying and taking their place in our lives recently. With the impact of technological developments, our lives are changing and developing. Individuals are expected to actively participate in such a rapid change process and improve themselves. While the computer usage ratio in Turkey was 23.6% in 2004, this rate increased to 59.6% in 2018, and internet usage increased from 18.8% in 2004 to 85.0% in 2022. In addition, internet access in households, which was 7% in 2004, grew to 94.1% in 2022 (Turkish Statistical Institute [TUIK], 2022). This change, which has taken place over 18 years, reveals the size and speed of the interaction between technology and humans. The situation is no different for teachers and students who need to keep up with technology. The use of technology in the field of education in Turkey has also increased in parallel with the general use.

In the world of children who become familiar with technology as soon as they are born, both parents and teachers need to educate themselves by keeping up with technological developments. In other words, it is necessary to keep up with the requirements of the age and evolve with the changing technology. In this evolution process, being constantly updated, being a part of the process while being updated, having basic technological competencies, producing new information using digital products, and protecting oneself and his/her environment in the virtual media can only be achieved by digital literacy. Digital literacy was first defined by Paul Gilster in 1997, with a particular focus on the cognitive part. Different models and definitions have been offered by researchers such as Martin (2008), Hague and Payton (2010), Ng (2012), and Bayrakcı (2020). Bayrakcı (2020) defined digital literacy as the whole of all competencies related to problem-solving, analysis, using digital technologies effectively in all areas of life, adapting to these technologies, and producing and developing new technologies. Martin (2008, p. 170) defined digital literacy as a skill and divided it into stages such as analysis, synthesis, evaluation, and integration. In addition, he determined these stages level by level and grouped them into 3 sections, as digital competence, digital use, and digital transformation. According to Martin, digital literacy is ranked by a system like a ladder. Hague and Payton (2010) argued that digital literacy consists of skills, knowledge, and understanding that provide critical, creative, distinctive, and safe practices with digital technologies. Accordingly, digital literacy consists of the creative thinking, extracting, evaluating, and criticizing the information obtained; recognizing sociocultural and historical influences and creating digital content, cooperation, using and adapting to new technologies; knowing how to use these technologies appropriately, accessing secure content, and communicating via media skills. Ng (2012) defined digital literacy as individuals' awareness of using digital tools and facilities appropriately to identify, access, manage, integrate, evaluate, analyze,

and synthesize digital resources, create new information, develop media statements, and communicate with others in context. According to such a broad definition, digital literacy is the ability to produce information in the digital environment, analyze, criticize, and evaluate existing information, and explore new information. Brooks-Young (2007) stated in her study for the International Society for Technology in Education (ISTE) that teachers of the digital age need to update and develop themselves in basic technology skills in world norms. Moreover, to be an effective educator in the digital age, it is necessary to have the following in possession: the ability to predict future education systems and express this vision, knowledge of digital applications with Web 2.0 tools, knowledge of the curriculum, content standards, and deciding how to teach with data knowledge, the willingness to be a lifelong learner, and the ability and willingness to work collaboratively with colleagues. Lankshear and Knobel (2003) evaluated digital literacy from a socio-cultural perspective, moved away from the cognitive perspective and skill-based understanding, and saw digital literacy as a more holistic and contextualized functioning of individuals in digital communities (List, 2019).

**Statement of Problem**

Digital literacy skills are dynamic with their constantly evolving, changing, and renewing structure. Therefore, an individual who was digitally literate yesterday should improve and change in order not to become inadequate and incomplete today. Being able to use all functions of technological infrastructure and tools and dominate technology in line with our needs is a requirement of digital literacy. When the technological development levels were examined, it was determined that digitally literate individuals do not make sufficient progress in the production phase. Students wandering in the endless digital ocean without a lifebuoy need teachers who act as lighthouses, teachers who are digitally literate, to guide them so that they do not get hurt in the storm. The level of digital literacy varies from person to person, from family to family, and even from country to country. In definitions made by Scandinavian countries and institutions such as the European Union and The Organisation for Economic Co-operation and Development (OECD), the concept of digital competence has a wider meaning than the concept of digital literacy. Therefore, there are differences in the level of digital literacy between countries in Europe and some countries in Asia and Africa (Bayrakcı, 2020). If students who are equipped with digital competencies, who can integrate technology into education, who can use a common technological language at the international level, and therefore their families, are to be part of a developing society that has an adequate technological infrastructure and meets the needs of the age, teachers must first be equipped with this infrastructure.

**Purpose and Importance of the Research**

In the literature, there are studies to determine the digital literacy levels of pre-service teachers and teachers from different branches, and the competencies of students and parents with different variables. This study examined the digital literacy levels of primary school teachers using some variables. The study was carried out with primary school teachers, as it is the branch that has the most communication with students, and they are the educators who prepare digital native students for life. Therefore, this study will make an important contribution to the literature and practitioners. This research aimed to determine the teachers' digital literacy proficiency perceptions and examine them comparatively according to some variables. Within this general purpose, answers to the following questions were sought:

1. What is the level of the digital literacy proficiency perceptions of the primary school teachers?
2. Do the primary school teachers' perceptions of digital literacy proficiency differ significantly according to the following?
    a) age,
    b) gender,
    c) education status,
    d) teaching seniority,
    e) the grade level they teach.
3. What are the opinions of the primary school teachers about digitalization and digital literacy?

## METHOD

This study, which examined the perceptions of primary school teachers regarding digital literacy proficiency, was carried out using the mixed method. First, quantitative data were collected. The qualitative data were also included in the evaluation using a structured interview form and in-depth interview, thus providing deeper and more comprehensive explanations. In mixed methods research, the weaknesses and losses that may arise in applying quantitative and qualitative research alone can be minimized based on the strengths of both methods (Balcı, 2018). In this study, first, the quantitative and then the qualitative research was conducted according to the "time dimension", one of the design criteria of mixed method research. Therefore, the dominant status was used as more emphasis was placed on the quantitative approach than the sequential and paradigm emphasis (Christensen, Johnson, & Turner, 2015). An explanatory mixed design was used from the classification dimension of the mixed method (Creswell & Clark, 2017).

**Subjects**

According to the data obtained upon request from the Eskisehir Provincial Directorate of National Education, a total of 1648 primary school teachers work in 1872 schools across Eskisehir Province and 96 schools in 5 districts were determined by the researcher. Especially in the determination of these 5 districts, cost and control difficulties were effective because instead of determining an ideal population, it was aimed to identify a realistic population. The low number of teachers working in districts far from the city center was also one of the determining factors. The quantitative participants of the research consisted of 711 volunteer primary

school teachers working in Eskisehir Province during the 2019–2020 academic year. In the research, "cluster sampling", one of the sampling types, was used.

> "Cluster sampling is the type of sampling in which all clusters in the population have an equal chance of being selected with all their elements. To perform such sampling, it is necessary to choose clusters from the population first. Sets with their elements have an equal chance of being selected. As individual differences are not adequately reflected in cluster sampling, potential sampling biases may occur" (Karasar, 2015, pp. 114–115).

Cluster sampling is highly useful when the population is spread over a very large and wide area (Özen & Gül, 2007). A cluster sample is formed by selecting subsets from the clusters determined in the population by the random, systematic, or stratified sampling method (Vogt, Gardner & Haeffele, 2012). For this reason, first, the population of the research and the sample size were determined, the districts were identified as clusters and limited, a list of all of the primary schools in these 5 clusters was prepared, and these schools were visited randomly. By reaching the primary school teachers in the primary schools determined in this way, effort was paid to minimize sampling bias. The teachers' demographic characteristics within the research scope are given in Table 1.

**Table 1.** Demographic Information of the Primary School **Teachers**

| **Gender** | **f** | **%** |
|---|---|---|
| Female | 502 | 70.6 |
| Male | 209 | 29.4 |
| Total | 711 | 100 |
| **Age (Group)** | ***f*** | ***%*** |
| 30 and below | 31 | 4.3 |
| 31–35 | 99 | 13.9 |
| 36–40 | 137 | 19.3 |
| 41–45 | 137 | 19.3 |
| 46–50 | 156 | 21.9 |
| 51–55 | 110 | 15.5 |
| 56 and above | 41 | 5.8 |
| Total | 711 | 100 |
| **Seniority interval** | **f** | **%** |
| 5 years and less | 13 | 1.8 |
| 6–11 years | 75 | 10.5 |
| 12–17 years | 170 | 23.9 |
| 18–23 years | 225 | 31.6 |
| 24 years and above | 228 | 32.1 |
| Total | 711 | 100 |
| **Education status** | **f** | **%** |
| Associate degree | 49 | 6.9 |
| Undergraduate | 609 | 85.7 |
| Graduate | 53 | 7.4 |
| Total | 711 | 100 |
| **Grade level taught** | **f** | **%** |
| 1st grade | 156 | 21.9 |
| 2nd grade | 152 | 21.4 |
| 3rd grade | 185 | 26.0 |
| 4th grade | 187 | 26.3 |
| Combined grade | 7 | 1.0 |
| Other | 24 | 3.4 |
| Total | 711 | 100 |

**Data Collection Tools**

In this study, which was conducted to determine the digital literacy proficiency perceptions of teachers, quantitative data were collected using the Digital Literacy Assessment Scale (DLAS) developed by Acar (2015) and the Personal Information Form prepared by the researchers, and qualitative data were collected using the Structured Interview Form also developed by the researchers.

Required permissions were obtained for the use of the scale developed by Acar (2015). The Digital Literacy Assessment Scale, which was prepared in the form of a 5-point Likert-type scale, consists of 5 subscales and a total of 41 items. Basic Device and Media Knowledge, Contextual Use, Awareness, Safe Participation, and Digital Identity Management are the subscales of the scale. In the Digital Literacy Assessment scale, scoring was made as Totally Adequate (5 points), Very Adequate (4 points), Moderately Adequate (3 points), Slightly Adequate (2 points), and Inadequate (1 point). A minimum of 17 and a maximum of 85 points can be obtained from the Awareness subscale of the Digital Literacy Assessment Scale, a minimum of 9 and a maximum of 45 points can be obtained from the Contextual Use subscale, a minimum of 6 and a maximum of 30 points can be obtained from the Safe

Participation subscale, a minimum of 4 and a maximum of 20 points can be obtained from the Digital Identity Management subscale, and a minimum of 5 and a maximum of 25 points can be obtained from the Basic Device and Media Knowledge subscale. While the minimum score that can be obtained from the entire scale is 41 (41 × 1), the maximum score (41 × 5) is 205. There are no reverse items in the scale.

Qualitative data were collected using the Structured Interview Form developed by the researchers. The researchers prepared a structured interview form with 5 questions covering all of the subscales of digital literacy. Before preparing the interview questions, a literature review was conducted in line with the subscales of digital literacy. The interview questions prepared by the researchers, and two experts working in the faculty of education were consulted for the suitability of the interview form, and after obtaining expert approval, necessary corrections were made and finalized according to the expert opinions. A pre-interview was held with 3 primary school teachers to check the suitability of the questions in terms of language and intelligibility. The interview form was finalized upon the positive feedback received from the pilot application and was applied to 7 volunteer teachers. After the teachers filled out the structured form, the researchers conducted interviews to understand the issue more deeply.

**Data Collection Process**

The data were collected with a measurement tool consisting of 2 different parts. In the first part, the researcher prepared a Personal Information Form consisting of 12 questions. In the second part, the Digital Literacy Assessment Scale developed by Acar (2015) and consisting of 41 items was used. According to the official numbers obtained from the Eskisehir Provincial Directorate of National Education, it was applied by the researcher by making copies that would be sufficient for all of the primary school teachers. The data collection tool was distributed and then collected by the researchers by visiting the schools. Before the data collection tool was distributed to the teachers, ethical rules regarding confidentiality were shared. The issues regarding how the scale should be filled and what should be considered while filling the scale were explained. The research was conducted in 60 primary schools. A total of 60 primary schools were visited by the researchers, and the volunteer teachers filled out the scale in about a month. A quantitative study group was formed by reaching approximately 37% of the primary school teachers working throughout Eskisehir Province. The qualitative dimension of the study was carried out by applying a structured interview form and in-depth interview with 7 primary school teachers. Easily accessible case sampling was used in selecting the teachers who participated in the qualitative research since they were both at the center of the research and in-depth interviews were conducted. During the interviews, with the explicit consent of the participants, an audio recording was conducted, and the audio files were transcribed to a Microsoft Word file by the researchers. The generated codes and themes were sent to a lecturer in the field of primary education at a public university to make necessary examinations and corrections. According to the feedback received, the codes and themes were clarified, and the participants' opinions were used in the study without making any changes.

**Data analysis**

Data from the Digital Literacy Assessment Scale were transferred to the computer environment to be analyzed with the statistical package program. The data were analyzed using IBM SPSS Statistics for Windows 21.0 (IBM Corp., Armonk, NY, USA). The normality of the variables was checked using Kolmogorov-Smirnov and Shapiro-Wilk tests and are shown in Table 2.

**Table 2.** Normality Test Results of Subscale

| | Kolmogorov-Smirnov | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|
| | **Statistics** | **f** | **P-value** | **Statistics** | **f** | **P-value** |
| Basic Device and Media Knowledge | 0.124 | 711 | 0.000 | 0.964 | 711 | 0.000 |
| Contextual Usage | 0.084 | 711 | 0.000 | 0.955 | 711 | 0.000 |
| Awareness | 0.081 | 711 | 0.000 | 0.954 | 711 | 0.000 |
| Safe Participation | 0.065 | 711 | 0.000 | 0.967 | 711 | 0.000 |
| Digital Identity Management | 0.105 | 711 | 0.000 | 0.941 | 711 | 0.000 |
| TOTAL | 0.050 | 711 | 0.000 | 0.977 | 711 | 0.000 |

As shown in Table 2, the normality test results of the variables do not show a normal distribution since the significance value for all of the variables was less than 0.05 (the significance level was taken as $P < 0.05$ in all of the analyses). It cannot be claimed that the data do not show a normal distribution, especially in social sciences, by looking at the Shapiro-Wilk or Kolmogorov-Smirnov results alone (Tabachnick & Fidell, 2013, p. 80). For this reason, these tests were not found to be sufficient for the normality, skewness, and kurtosis values of the distribution of variable scores (Table 3), and the shape of the histogram and Q-Q Plot plots were examined. The skewness and kurtosis values for the normal distribution of the data ranged from –1.5 to 1.5. In addition to the skewness and kurtosis data, the fact that the mean and median values were close or equal to each other indicates that the data were normally distributed (Tabachnick & Fidell, 2013, p. 87). When Table 3 is examined, it can be claimed that the data show a normal distribution.

**Table 3.** Descriptive Statistical Analysis of the Subscales

| | | Skewness | | Kurtosis | | | |
|---|---|---|---|---|---|---|---|
| **Subscales** | **f** | **Statistics** | **Std. Error** | **Statistics** | **Std. Error** | **Mean** | **Median** |
| Basic Device and Media Knowledge | 711 | 0.130 | 0.092 | –0.634 | 0.183 | 17.0549 | 16.00 |
| Contextual Usage | 711 | –0.366 | 0.092 | –0.525 | 0.183 | 33.8833 | 35.00 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Awareness | 711 | –0.478 | 0.092 | 0.166 | 0.183 | 67.7257 | 68.00 |
| Safe Participation | 711 | –0.247 | 0.092 | –0.330 | 0.183 | 21.3657 | 21.00 |
| Digital Identity Management | 711 | –0.436 | 0.092 | –0.095 | 0.183 | 14.8734 | 15.00 |
| TOTAL | 711 | –0.233 | 0.092 | –0.251 | 0.183 | 154.9030 | 154.00 |

As it showed a normal distribution, the independent samples t-test was applied to determine whether the digital literacy proficiency perceptions of the teachers showed a significant difference according to their gender, having a personal computer, and having a constant internet connection on their mobile phone and personal computer. One-way analysis of variance (ANOVA) was used to determine whether the teachers' digital literacy proficiency perceptions showed a significant difference according to variables such as age, educational status, seniority, grade level taught, technology/applications they use in education, and technology education they received. Since the ANOVA results were significant, the Scheffe and Bonferroni tests were used to compare all of the combinations between the groups in case the variances were equal, which does not require that the number of observations are equal. The Scheffe test is a type of post hoc statistic that is flexible and preferred when the number of groups to be compared is large. The Bonferroni test, like the Scheffe test, is a type of post hoc statistic that does not require the principle of an equal sample number (Kayri, 2009).

The qualitative data obtained with the structured form and in-depth interviews were analyzed using the descriptive analysis method. The data obtained by this analysis method were explained and classified according to the subscales. In the descriptive analysis, direct quotations were included to show the participants' views clearly. Including first-hand citations that contribute to the reliability of the qualitative study. As a result of the descriptive analysis, the raw data were processed, classified, and coded, and the results were reached based on the interpretation of the researcher (Yıldırım & Şimşek, 2016). Therefore, the participants were given codes as T1, T2, T3, …, T7, while their names were kept anonymous.

**Validity/Reliability**

In order to determine the internal consistency coefficient, Cronbach α values of the scale's subscales and the entire scale were calculated by Acar, who developed the scale. The values found were 0.899 for the Basic Device and Media Knowledge subscale, 0.958 for the Contextual Use subscale, 0.968 for the Awareness subscale, 0.928 for the Safe Participation subscale, 0.908 for the Digital Identity Management subscale, and 0.980 for the entire scale. The internal consistency coefficient Cronbach α value calculated by the researcher for this study was calculated as 0.924 for the Basic Device and Media Knowledge subscale, 0.951 for the Contextual Use subscale, 0.969 for the Awareness subscale, 0.930 for the Safe Participation subscale, 0.941 for the Digital Identity Management subscale, and 0.981 for the entire scale. The Cronbach α value for the internal consistency coefficient calculated for the subscales and the entire scale for this study was over 90. This value shows that the scale has high reliability (Kılıç, 2016). The researcher prepared a structured interview form with 5 questions covering all of the subscales of digital literacy. Two experts working at the faculty of education were consulted for the suitability of the interview form, and after obtaining expert approval, necessary corrections were made and the form was applied to 3 primary school teachers for the pilot application. The interview form, which was finalized upon the positive feedback received from the pilot application, was applied to 7 teachers who volunteered.

**Ethical Considerations**

This study was found to comply with research and publication ethics with the 10.10.2019 dated and 115566 numbered decision of the Social and Human Sciences Scientific Research and Publication Ethics Committee of Eskisehir Osmangazi University. In order to carry out the study in schools affiliated with the Eskisehir Provincial Directorate of National Education, the approval dated 08.11.2019 and numbered 22142357 was obtained. In addition, the governor's approval dated 07.11.2019 and numbered 22062450 was received and the study was implemented in 60 primary schools throughout Eskisehir Province. Scientific and ethical rules were followed in the data collection and writing processes of this study. No falsifications were made in any part of the data used, and the data have not been manipulated.

**Findings**

**Digital Literacy Competence Perception Levels of Primary School Teachers**

The scores that the participants can obtain from the subscales and the entire scale, determined by Acar, who developed the DLAS, and their proficiency levels according to these scores are shown in Table 4.

**Table 4.** Scoring Ranges Determined for the DLES and its Subscales

| SCALE/ LEVEL | Awareness | Contextual Usage | Safe Participation | Digital Identity Management | Basic Device and Media Knowledge | TOTAL |
|---|---|---|---|---|---|---|
| Totally Adequate | 73–85 | 41–45 | 26–30 | 17–20 | 21–25 | 173–205 |
| Very Adequate | 59–72 | 33–40 | 21–25 | 14–16 | 17–20 | 140–172 |
| Moderately Adequate | 45–58 | 25–32 | 16–20 | 11–13 | 13–16 | 107–139 |
| Slightly Adequate | 31–44 | 17–24 | 11–15 | 9–10 | 9–12 | 74–106 |
| Inadequate | 17–30 | 9–16 | 6–10 | 4–7 | 5–8 | 41–73 |

As a result of the research, the scores obtained from the subscales and the data of the perceived levels are presented in Table 5.

**Table 5.** Mean Scores of the Subscales and Perceived Digital Literacy Levels of the Primary School Teachers

| Subscales/ Score and Level | Mean Score | Perceived Level |
|---|---|---|
| Awareness | 67.73 | Very Adequate |
| Contextual Usage | 33.90 | Very Adequate |
| Safe Participation | 21.37 | Very Adequate |
| Digital Identity Management | 14.87 | Very Adequate |
| Basic Device and Media Knowledge | 17.05 | Very Adequate |
| Total | 154.90 | Very Adequate |

According to the results of the research, it was determined that the participants received 67.73 points from the Awareness sub-scale and leveled Very Adequate, 33.90 points from the Contextual Use sub-scale and leveled Very Adequate, 21.37 points from the Safe Participation sub-scale and leveled Very Adequate, 14.87 points from the Digital Identity Management sub-scale and leveled Very Adequate, 17.05 points from the Basic Device and Media Knowledge sub-scale and leveled Very Adequate, and 154.90 points from the entire scale and leveled Very Adequate. It can be argued that the primary school teachers perceive themselves as Very Adequate from various proficiency areas of digital literacy and they have a great command of these proficiency areas.

ANOVA was conducted to determine whether the digital literacy levels of the primary school teachers differed according to their age, and the results of the analysis are presented in Table 6.

**Table 6.** ANOVA Results of the Digital Literacy Levels of Primary School Teachers by Age

| Subscale | Variance source | Sum of squares | SD | Mean of squares | *F* | *P-value* |
|---|---|---|---|---|---|---|
| Basic Device and Media Knowledge | Within-group | 451.609 | 6 | 75.268 | 3.721 | 0.001 |
| | Between-group | 14241.252 | 704 | 20.229 | | |
| | Total | 14692.861 | 710 | | | |
| Contextual Usage | Within-group | 4714.107 | 6 | 785.684 | 13.328 | 0.000 |
| | Between-group | | 41499.204 | 704 | 58.948 | |
| | Total | 46213.311 | 710 | | | |
| Awareness | Within-group | 5180.796 | 6 | 863.466 | 5.904 | 0.000 |
| | Between-group | | 102960.723 | 704 | 146.251 | |
| | Total | 108141.519 | 710 | | | |
| Safe Participation | Within-group | 1551.112 | 6 | 258.519 | 8.878 | 0.000 |
| | Between-group | | 20499.811 | 704 | 29.119 | |
| | Total | 22050.923 | 710 | | | |
| Digital Identity Management | Within-group | 705.802 | 6 | 117.634 | 9.184 | 0.000 |
| | Between-group | | 9016.806 | 704 | 12.808 | |
| | Total | 9722.608 | 710 | | | |
| TOTAL | Within-group | 49792.696 | 6 | 8298.783 | 9.573 | 0.000 |
| | Between-group | | 610319.608 | 704 | 866.931 | |
| | Total | | 660112.304 | 710 | | |

In Table 6, there is a statistically significant difference between the teachers' digital literacy levels and their ages ($F_{6,704} = 9.573$, $P < 0.05$). In this case, post hoc analyses were performed to determine between which groups significance occurred, and the Scheffe multiple comparison test, which is widely used in cases where variances are homogeneous, was employed. In line with the Scheffe test results, the following statistically significant ($P < 0.01$) differences were determined: Between the 30 age group and 56 and above age group, in favor of the 30 and below age group; between the 31–35 age group and 46–50 age group, and 51–55 age group and 56 and above age group, in favor of the 31–35 age group; between the 36–40 age group and 51–55 age group and 56 and above age group, in favor of the 36–40 age group; and between the 41–45 age group and 56 and above age group, in favor of the 41–45 age group. Accordingly, it was revealed that the digital literacy levels of the primary school teachers in the 30 and below age group were higher than those of the primary school teachers aged 56 and above, the digital literacy levels of the primary school teachers in the 31–35 age group were higher than those of all of the primary school teachers over the age of 46, and primary school teachers in the 41–45 age group had a higher level of digital literacy than primary school teachers aged 56 and over. No significant difference was found between other age groups ($P > 0.05$).

In order to determine whether the digital literacy levels of the primary school teachers changed according to their gender, an independent sample t-test was conducted, and the results of the analysis are presented in Table 7.

**Table 7.** T-Test Results of the Digital Literacy Levels of Primary School Teachers by Gender

| Gender | N | $\bar{x}$ | SS | t | df | P-value |
|---|---|---|---|---|---|---|
| Female | 502 | 152.75 | 28.93978 | –2.938 | 709 | 0.003 |
| Male | 209 | 160.08 | 33.43921 | | | |

When the t-test results, in which the digital literacy levels of the primary school teachers participating in the research were compared according to gender, in Table 7 were analyzed, there was a statistically significant difference ($t(709) = –2.938$, $P < 0.05$). Accordingly, the male primary school teachers' digital literacy levels ($\bar{x} = 160.08$) were higher than the female primary school teachers' digital literacy levels ($\bar{x} = 152.75$).

ANOVA was conducted to determine whether the digital literacy levels of the primary school teachers differed according to their educational status, and the results of the analysis are presented in Table 8.

**Table 8.** ANOVA Results of the Digital Literacy Levels of Primary School Teachers by Educational Status

| Subscale | Variance source | Sum of squares | SD | Mean of squares | *F* | *P-value* |
|---|---|---|---|---|---|---|
| Basic Device and Media Knowledge | Within-group | 375.400 | 2 | 187.700 | 9.282 | 0.000 |
| | Between-group | 14317.460 | 708 | 20.222 | | |
| | Total | 14692.861 | | 710 | | |
| Contextual Usage | Within-group | 1511.752 | 2 | 755.876 | 11.972 | 0.000 |
| | Between-group | 44701.559 | 708 | 63.138 | | |
| | Total | 46213.311 | | 710 | | |
| Awareness | Within-group | 1902.932 | 2 | 951.466 | 6.341 | 0.002 |
| | Between-group | 106238.587 | 708 | 150.055 | | |
| | Total | 108141.519 | | 710 | | |
| Safe Participation | Within-group | 848.910 | 2 | 424.455 | 14.174 | 0.000 |
| | Between-group | 21202.013 | 708 | 29.946 | | |
| | Total | 22050.923 | 710 | | | |
| Digital Identity Management | Within-group | 491.881 | 2 | 245.940 | 18.864 | 0.000 |
| | Between-group | 9230.727 | 708 | 13.038 | | |
| | Total | 9722.608 | 710 | | | |
| TOTAL | Within-group | 23046.602 | 2 | 11523.301 | 12.806 | 0.000 |
| | Between-group | 637065.702 | 708 | 899.810 | | |
| | Total | 660112.304 | 710 | | | |

In Table 8, there is a significant difference between the digital literacy levels of teachers and their educational status ($F(2.708) = 12.806$, $P < 0.05$). In this case, post hoc analyses were performed to determine between which groups the significance occurred, and the Scheffe multiple comparison test was employed. In accordance with the Scheffe test results, a statistically significant difference ($P < 0.01$) was found between undergraduate and associate degree holders in favor of undergraduate degree holders, and between postgraduate or doctorate graduates and undergraduate and associate degree holders in favor of postgraduate or doctorate holders. Accordingly, it was revealed that the digital literacy levels of the primary school teachers with a Master's or Doctorate were at a higher level than those of the primary school teachers with a Bachelor's and Associate degree, and the digital literacy levels of the primary school teachers with a Bachelor's degree were higher than those of the primary school teachers with an Associate degree.

ANOVA was conducted to determine whether the digital literacy levels of the primary school teachers differed according to their seniority in the profession, and the results of the analysis are presented in Table 9.

**Table 9.** ANOVA Results of the Digital Literacy Levels of Primary School Teachers by Seniority in their Profession

| Subscale | Variance source | Sum of squares | SD | Mean of squares | *F* | *P-value* |
|---|---|---|---|---|---|---|
| Basic Device and Media Knowledge | Within-group | 363.143 | 3 | 121.048 | 5.972 | 0.001 |
| | Between-group | 14329.718 | 707 | 20.268 | | |
| | Total | 14692.861 | 710 | | | |
| Contextual Usage | Within-group | 4238.471 | 3 | 1412.824 | 23.797 | 0.000 |
| | Between-group | 41974.840 | 707 | 59.370 | | |
| | Total | 46213.311 | 710 | | | |
| Awareness | Within-group | 4289.779 | 3 | 1429.926 | 9.735 | 0.000 |
| | Between-group | 103851.740 | 707 | 146.891 | | |
| | Total | 108141.519 | 710 | | | |
| Safe Participation | Within-group | 1159.850 | 3 | 386.617 | 13.084 | 0.000 |
| | Between-group | 20891.073 | 707 | 29.549 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Total | 22050.923 | 710 | | | |
| Digital Identity Management | Within-group | 579.960 | 3 | 193.320 | 14.949 | 0.000 |
| | Between-group | 9142.647 | 707 | 12.932 | | |
| | Total | 9722.608 | 710 | | | |
| | Within-group | 42803.645 | 3 | 14267.882 | 16.341 | 0.000 |
| TOTAL | Between-group | 617308.658 | 707 | 873.138 | | |
| | Total | 660112.304 | 710 | | | |

In Table 9, there is a significant difference between the digital literacy levels of the teachers and their seniority in the profession ($F(3,707) = 16.341$, $P < 0.05$). In this case, post hoc analyses were performed to determine between which groups the significance occurred, and the Scheffe multiple comparison test was used.

When the analysis results of the Scheffe test were examined, a statistically significant ($P < 0.01$) difference was found between the primary school teachers with 11 years and less seniority and those with 18–23 years of seniority and 24 years or more seniority in favor of those with 11 years or less seniority. A statistically significant difference was also observed between those with 12–17 years of seniority and those with 18–23 years of seniority and 24 years or more seniority in favor of those with 12–17 years of seniority. Accordingly, it was revealed that the digital literacy levels of primary school teachers with 11 years or less seniority were higher than those of primary school teachers with more than 18 years of seniority, and the digital literacy levels of primary school teachers with 12–17 years of seniority were higher than those of primary school teachers with more than 18 years of seniority. No significant difference was found between the other professional seniority groups ($P > 0.05$).

In order to determine whether the digital literacy levels of the primary school teachers differed according to the grade level they teach, ANOVA was performed and the results of the analysis are presented in Table 10.

**Table 10.** ANOVA Results of the Digital Literacy Levels of Primary School Teachers by the Grades They Teach

| **Subscale** | **Variance source** | **Sum of squares** | **SD** | **Mean of quares** | ***F*** | ***P-value*** |
|---|---|---|---|---|---|---|
| Basic Device and Media Knowledge | Within-group | 70.725 | 5 | 14.145 | 0.682 | 0.637 |
| | Between-group | 14622.136 | 705 | 20.741 | | |
| | Total | 14692.861 | 710 | | | |
| Contextual Usage | Within-group | 612.044 | 5 | 122.409 | 1.892 | 0.093 |
| | Between-group | 45601.267 | 705 | 64.683 | | |
| | Total | 46213.311 | 710 | | | |
| Awareness | Within-group | 301.502 | 5 | 60.300 | 0.394 | 0.853 |
| | Between-group | 107840.016 | 705 | 152.965 | | |
| | Total | 108141.519 | 710 | | | |
| Safe Participation | Within-group | 221.053 | 5 | 44.211 | 1.428 | 0.212 |
| | Between-group | 21829.870 | 705 | 30.964 | | |
| | Total | 22050.923 | 710 | | | |
| Digital Identity Management | Within-group | 103.654 | 5 | 20.731 | 1.519 | 0.181 |
| | Between-group | 9618.953 | 705 | 13.644 | | |
| | Total | 9722.608 | 710 | | | |
| TOTAL | Within-group | 4928.249 | 5 | 985.650 | 1.061 | 0.381 |
| | Between-group | 655184.055 | 705 | 929.339 | | |
| | Total | 660112.304 | 710 | | | |

In Table 10, there is no significant difference between the digital literacy levels of the primary school teachers and the grade level they teach ($F5,705 = 1.061$, $P > 0.05$). The difference between the subscales of the digital literacy scale and the grade level taught by the primary school teachers was not statistically significant.

**Views of the Teachers on the Subscales of the Digital Literacy Assessment Scale**

In this section, the views of the primary school teachers on these subscales of the Digital Literacy Assessment Scale, namely Basic Device and Media Knowledge, Contextual Use, Awareness, Safe Participation, and Digital Identity Management, are provided.

**Opinions on the basic device and media knowledge subscale**

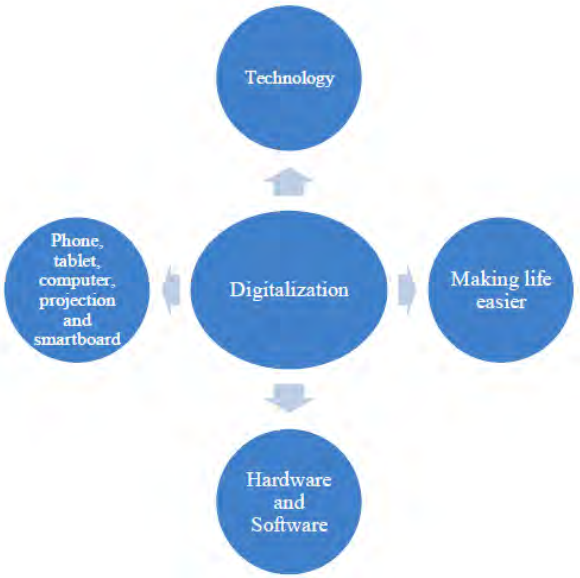
In order to determine what the primary school teachers understand about digitalization, the participants were asked the following questions: 'What comes to mind when you hear the word digitalization? What are the digital devices you use and what are your opinions about their hardware and software?' Some of the answers given by the participants to these questions are given below:

> "Digitalization is the transfer of accessible information, e.g., files, photos, documents into a digital medium that can be read by a computer. The digital tools I use most frequently are computers and mobile phones. My knowledge of their software and hardware is limited." (T2)

> "Digitalization is to continue education by using current technology. The digital tools I use are mobile phones, computers, and projectors. I don't know much about their hardware and software." (T4)

T1 expressed his thoughts as "when digitalization is mentioned, I think of mobile phones, computers, and tablets." T3 and T6, who drew a general framework, made the definition of making life easier. It was concluded that the knowledge of almost all of the primary school teachers was sufficient, and this result supports the results of the quantitative analysis. The categories of the digitalization subscale created regarding the answers given by the primary school teachers' participating in the research are shown in Figure 1.

**Figure 1.** Categories of the Digitalization Subscale




T3, who could distinguish between the views of the digital devices used in educational environments and in daily life, indicated that the use of smart boards in education is also related to digitalization.

In general, information about digitalization and digital environments appeared to be at a Very Adequate level, but hardware and software knowledge was at the basic user level. T2, T4 and T5 explained this as their information being limited and at the user level. T1 stated that he knew enough about the operating system and programs, T6 stated that he knew enough about hardware and little about software, and T7 said that software and hardware developed every day and made our lives easier.

**Opinions on the contextual use subscale**

In order to determine the extent to which the primary school teachers can use different digital tools such as software and hardware, the participants were asked the following questions: "Can you perform things like writing, creating tables, and preparing presentations with the digital tools you own or use? Can you download/obtain any of these from somewhere when you need them?" Some of the answers given by the participants to these questions are given below:

> "I can do many things with my computer and smart phone. Preparing a presentation, writing, creating tables and graphics, and making pre-event preparations for my class are among them. When I need them, I can download them from various sites using the internet." (T7)

> "I know how to work in Word and Excel. I also know how to make tables, write articles in Word and especially Excel, and prepare presentations in PowerPoint. Yes, if there is information about them on the sites, I can easily download them from there." (T1)

Contextual use is related to basic skills such as using a computer, but also requires different digital literacy skills. It was determined that all of the primary school teachers who expressed their views on the Contextual Use subscale, which is the subscale that includes software and hardware, fully met the requirements of this subscale and were Very Adequate.

The result of this descriptive analysis supports the findings at the Very Adequate level obtained by the analysis of the quantitative data. The categories of the Contextual Use subscale are presented in Figure 2.

T2 stated that he could carry word processing, spreadsheet, and presentation preparation software with a USB memory stick, send them as e-mail attachments, and open them as attachments. The primary school teachers who participated in the research stated that they could perform almost all of the online transactions and that they used their mobile phones for these operations. They stated that they were able to receive printouts from the printer as a result of these processes. All of the primary school teachers who participated in the research said that they had the skills to use word processing software, spreadsheet software, and presentation preparation software. The quantitative results of the study and the answers given by the primary school teachers to this subscale were parallel to each other.

**Figure 2.** Categories of the Contextual Use Subscale Opinions


**Opinions on the awareness subscale**

The state of having enough critical thinking skills to research every event, change, and development that occurs in the digital world and real life is used to define the Awareness subscale. To determine the extent of the primary school teachers' critical thinking skills, the participants were asked the following questions: "What is surfing on the Internet? What should we pay attention to for safe surfing? Have you received any training for this?" Some of the answers given by the participants to these questions are given below:

> "Surfing the Internet is navigating between interconnected Internet networks. It's necessary to use licensed software and interfaces for safe surfing. I didn't receive any tutorial on this subject other than the courses in my undergraduate education." (T5)

> "Surfing, as the old saying goes, means hopping from one site to another, navigating left and right. We received a tutorial about it, but it wasn't very helpful. However, I think that I can handle this by ensuring the firewall of the computer on my own." (T4)

The categories of the participants on the awareness subscale are shown in Figure 3.

When the primary school teachers who participated in the study were asked what surfing the Internet was, T1, T3, T4, T5, and T7 made similar definitions, such as looking at websites, browsing randomly, and jumping from one site to another. T2, on the other hand, described it in more detail as "looking at the news, videos, photos on the websites", and T6 defined it as doing research and reaching what we want. When asked what we should pay attention to for safe browsing between websites, the teachers gave the following answers: T1 and T7 did not enter websites they did not know, T1 and T4 kept the firewall of the computer up to date, T2 deleted their digital footprints in order not to leave any digital traces after surfing, T3 and T6 did not share their personal information, T5 and T7 used licensed software and interface and antivirus programs, and T7 specifically used unpredictable passwords.

**Figure 3.** Categories of the Awareness Subscale


For internet browsing and security internet, T1, T2, T4, and T7 stated that they did not receive any training or that the education they received was not useful, T5 mentioned that they received education in undergraduate education, and T3 and T6 explained that they attended an in-service seminar. It was determined that all of the participants, whether they had received training or not, had developed themselves and were aware of the virtual environment for internet surfing and safe internet. The descriptive analysis of the participants' opinions in the Awareness subscale and the analysis results of the data obtained from the quantitative data showed consistency.

**Opinions on the Safe Participation Subscale**

A skill such as social networking, which is indispensable in today's digital world, and creating a membership for them, actively using these networks, sharing information, documents, photos or videos, adjusting the settings of the internet browser such as privacy, security, antivirus protection, and noticing cases of identity theft and virus infection constitute the subscale of safe participation. To determine the primary school teachers' use of social networks, sharing, and self-protection skills, the participants were asked the following questions: "Do you have a membership in any social networks? If so, can you upload photos, videos, documents, etc.? Can someone who knows you guess your password?" Some of the answers given by the participants to these questions are given below:

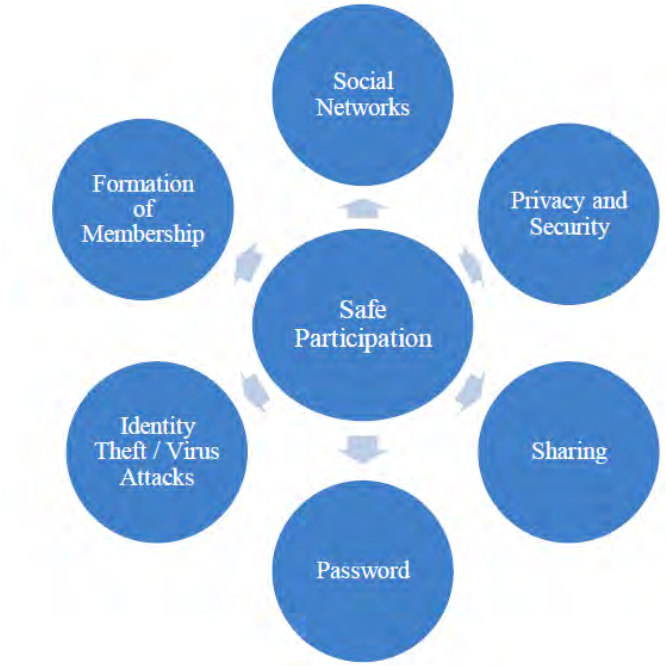
> "Yes, I refrain from sharing photos or videos as much as possible. I don't like to share them. No one who knows me can guess my password. This is why it's not appropriate to upload photos and documents, especially since photos can be published in other environments, in inappropriate environments. I don't want to publish them." (T6)

> "I'm a member of a social network. Like Facebook, Instagram, and Twitter. I'm sharing posts on these sites. Someone who knows me can't guess my password." (T3)

> "I'm a member of many social networks. I upload videos, photos, documents, etc., to them. When creating my password, I use uppercase, lowercase, numbers, and punctuation marks. That is, even my father's son can't guess my password." (T4)

The categories of the Safe Participation subscale are shown in Figure 4.

**Figure 4.** Categories of the Safe Participation Subscale




All of the teachers participating in the study have memberships in social networks, and the teachers, except for T1, stated that they use them actively. T1, T2, and T6 stated that they did not upload documents, photos, or videos unless they had to because they did not trust social networks, while T3, T4, T5, and T7 said that they uploaded and downloaded them. T1 said that he is cautious about uploading because he has read several negative news stories about photos uploaded without permission in news bulletins and internet news sites. All of the primary school teachers have stated that even the people closest to them cannot guess the passwords they have created for these networks and virtual environments. When the aims and scope of the subscale and the answers of the participants were compared, it was evaluated that the participants were Very Adequate, which is similar to the results of the quantitative data.

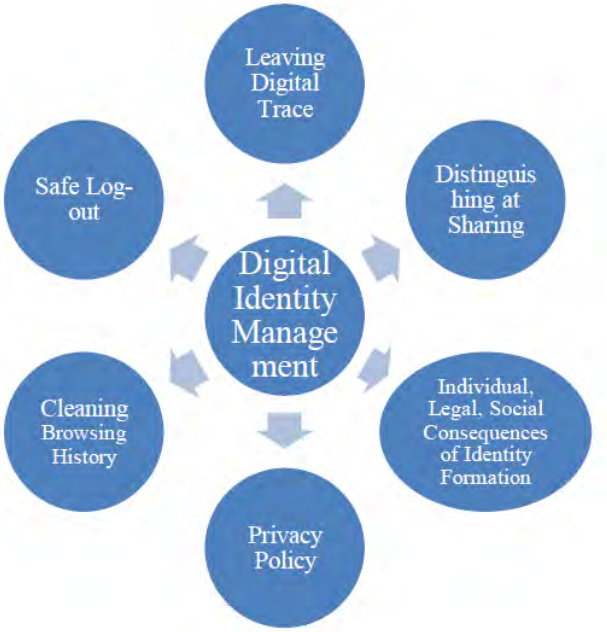
**Opinions on the digital identity management subscale**

Skills such as not leaving any personal information, passwords, or documents behind after surfing in the digital environment, distinguishing all kinds of information, documents, photographs, and videos that can and should not be shared in these environments, knowing what to do in cases such as the loss of an account, identity theft in the virtual environment, their legal and social consequences, and knowing the privacy policies of the websites used and what they mean for them form the subscale of Digital Identity Management. The participants were asked the following questions to determine their status after surfing, clearing their history, complying with privacy policies, and knowing their legal rights and responsibilities regarding virtual life: "What is a digital trace? Do you know? What do you do when you log out after using a computer or digital device that does not belong to you?" Some of the answers given by the participants to these questions are given below:

> "In the sense of leaving a digital trace, website addresses, passwords, etc., which remain after using it on the computer, these are probably included in the concept of digital trace. Or like usernames. When I leave after using a computer or digital device that doesn't belong to me, I usually select options such as clearing the history, don't remember the password, or the username at startup. When I log out, I don't leave Internet Explorer or Chrome open, I close it completely." (T1)

The categories of the participants for the Digital Identity Management subscale are shown in Figure 5.

**Figure 5.** Categories on the Digital Identity Management Subscale




The primary school teachers who participated in the study were asked what it means to leave a digital trace. T1 explained that they were site addresses, user names, and passwords used after using the computer, T2 explained that they left documents, photos, or videos in digital tools, and T5 explained that all kinds of information they shared while using the internet and every site they entered were digital fingerprints. T7, unlike the other teachers, defined the concept of a digital trace as "any kind of trace we leave intentionally or unintentionally, by touching or typing". T3 defined it as "seeing what the person using that device has done after using a digital device that does not belong to them". The common idea of the study group in the definition is all kinds of traces they leave behind after using the internet on a digital device, and this definition is correct. When the primary school teachers were asked what they did after using a digital device that did not belong to them, all of the teachers said that they used the safe logout option. It can be stated that the sensitivity of the primary school teachers participating in the study on security measures and digital traces was parallel with the results of the quantitative study.

## CONCLUSION, DISCUSSION, AND RECOMMENDATIONS

### Digital literacy levels of the primary school teachers

The first result of this study was that, as an answer to the first research question, the primary school teachers see their literacy level at a Very Adequate level according to the answers they gave to the survey. In other words, when the scores obtained from all 5 subscales of the Digital Literacy Assessment Scale were examined, the digital literacy of the primary school teachers appeared as Very Adequate. Arslan (2019) and Öçal (2017) reached similar results in their studies and found that the digital literacy scores of primary school teachers were high. Similarly, Özoğlu (2019) and Kozan (2018) found that the digital literacy proficiency of pre-service teachers was at a high level in their studies. Cote and Milliner (2018), in their study with English teachers, concluded that they were very confident that they used digital technology to support their teaching inside and outside of their classrooms. Güven Demir et al. (2016), in their research with primary and secondary school teachers, determined that the teachers' metaphors regarding the concept of digital literacy had dimensions that overlap with the cognitive, technical, and socio-emotional dimensions of digital literacy explained by Ng (2012). In the same study, teachers working in primary schools mostly included metaphors in the category of information literacy. When the literature was examined, although there were many similar studies, the high digital literacy proficiency perception of primary school teachers supports the result of this study. It is a necessity that teachers who guide a generation born in the 21st century, who are prepared for technology, and who carry out the literacy process using methods familiar to these children, have high levels of digital literacy. It can be concluded that primary school teachers are willing and interested in using technology in education and that they adopt its use. The results of this research and other similar studies can be considered a reflection of the current situation. However, the digital literacy levels of all teachers, especially primary school teachers, should reach an adequate level to adapt and keep up with the technology that shows instant changes. Primary school teachers should be digital literate individuals, but they are deficient in using it as an educational tool (Karakuş & Ocak, 2019).

### Differentiation of the digital literacy levels of the primary school teachers according to different variables

There was a significant difference between the primary school teachers' digital literacy levels and their subscales and their ages. In other words, the age of primary school teachers is effective on their digital literacy levels. As the age of primary school teachers decreases, their digital literacy levels increase. The main reason for this can be shown to be that primary school teachers, who are closer to Generation Z in terms of age, use digital devices and environments more closely and are acquainted with digital devices

earlier. Öçal (2017) found a similar result in his study and concluded that the digital literacy level of primary school teachers in the 21–30 age group was higher than that at higher ages. In addition, Yeşildal (2018) reached a similar conclusion between age and digital literacy levels and found that the level of digital literacy decreased at higher ages. The emergence of significant differences between age groups depends on the period they were born in and the teachers' desire to develop themselves digitally. It can be said that as one gets older, it becomes more difficult to keep up with technology and reluctance occurs. For this reason, incentives should be given to increase the digital literacy levels of older teachers.

According to the results of the analysis carried out to determine whether the digital literacy levels of the primary school teachers and their subscales differed according to the gender variable, a statistically significant difference was found. In other words, the digital literacy levels of primary school teachers vary according to their gender. The digital literacy levels of the male teachers participating in the study were higher than those of the female teachers. Kıyıcı (2008), Acar (2015), Yeşildal (2018), and Özerbaş and Kuralbayeva (2018) reached similar results in their studies, and they concluded that males have higher digital literacy levels than females. However, in a study by Kozan (2018) with pre-service teachers, gender did not make a difference in the attitudes toward digital literacy. Yaman (2019) also concluded that there is no relationship between genders in terms of digital literacy and underlined that every individual's access to technological opportunities is equal in the 21st century, regardless of gender. Males and females have equal opportunities to access education and technological opportunities; however, it is a surprising result that gender showed differences in the level of digital literacy. This is because males are more interested and curious about technological equipment than females. In response to the emergence of such a result, efforts should be paid by making positive discrimination for the digital development of female teachers.

According to the results of the analysis conducted to determine whether the digital literacy levels and subscales of the primary school teachers differed according to the education status of the teachers, a statistically significant difference emerged. When evaluated together with all of the subscales of the scale, the education level of primary school teachers affects their digital literacy level. The digital literacy levels of primary school teachers with graduate degrees were higher than those of primary school teachers with undergraduate and associate degrees. Similarly, the digital literacy levels of primary school teachers with undergraduate degrees were higher than those of primary school teachers with associate degrees. In other words, as the years of education increase, the level of digital literacy also increases. In the study conducted by Acar (2015) with parents, it was concluded that the level of education is related to digital literacy and that as the level of education increases, the evaluation scores of the parents regarding their literacy levels also increase. Öçal (2017) determined that teachers' educational status is an effective factor in determining their digital literacy levels and that teachers who receive postgraduate education consider themselves more competent in terms of digital literacy. However, Arslan (2019) did not find any relationship between educational status and digital literacy levels. Academic studies and the preparation of presentations, especially with Web 2.0 tools, in the graduate level education of many universities, the use of these presentations in the field, in the courses at schools, and in program development studies bring the level of digital literacy at the graduate level to a fully sufficient level. Primary school teachers responsible for the education of primary school students are expected to improve themselves and then their students in this field by receiving postgraduate education in their field.

According to the results of the analysis conducted to determine whether the digital literacy levels and subscales of the primary school teachers differed according to the professional seniority of the teachers, a statistically significant difference occurred. When evaluated together with all of the subscales of the scale, the years of service of primary school teachers in their professions affect their level of digital literacy. In other words, as the years of service of teachers in their profession increase, their digital literacy levels decrease. This may develop depending on the technological education received by the new teachers in the education faculties, their being closer to Generation Z as an age group, and even being more interested in technology and digitalization if they are the parents of children in Generation Z. Arslan (2019) concluded that as the seniority of teachers increases, their level of digital literacy decreases, and hypothesized that this may be because young teachers take more technical courses in their educational life. He explained that teachers with more years of service could not keep up with technological developments. Öçal (2017) concluded that professional seniority is a distinguishing variable on teachers' digital literacy proficiency perceptions and found that teachers who have just started their professional life consider themselves more competent in digital literacy. Another conclusion that Öçal reached was the following: The fact that teachers with more seniority years did not have a high digitization rate when they started working, the scarcity of digital tools and environments and the difficulty of accessing them, and the few or no in-service courses they received can be responsible for their low levels of digital literacy. Menşan (2019), on the other hand, concluded that there is no relationship between professional seniority and the determination of digital profiles.

Since primary school is a 4-year education process and the traditional literacy teaching process takes about 2 years, primary school teachers can use classical methods as well as digital applications, programs, and environments. However, this does not directly cause primary school teachers to evaluate their digital literacy levels as high or low. It is impossible to imagine a school without the internet and a teacher without a computer at a time when almost all of humanity is living a mobile life. Moreover, in our society, where digitalization, digitally literate, and techno individuals are in the majority, teachers who educate the future must adapt to this. Primary school teachers with high digital literacy tend to use more and more different technological tools and applications. As a result of this, it is seen that the students studying in that class contribute to their development from positive self-esteem to social cooperation. It will be a very important step for primary school teachers to advance this process with the digital game characters that they developed, especially at the beginning of the literacy process, both for themselves and for their student's academic and individual development. Especially during the COVID-19 pandemic process, the digital content produced by teachers to be used in the teaching process and teaching without time and space limits made learning faster and more permanent and motivated students

to pay attention in the lesson. In doing so, both teachers and students should never stop following and practicing internet or online ethics.

**Limitations**

This study, which aimed to determine teachers' perceptions of digital literacy competence, was limited to the central districts of Eskişehir (Tepebaşı and Odunpazarı) and the Seyitgazi, Sarıcakaya, and Mihalgazi districts. The study was limited to the primary school teachers who participated in the study during the 2019–2020 academic year and the data obtained from the measurement tool developed as a data collection tool.

According to the results of the research, the following recommendations were developed:

For the digital literacy proficiency of primary school teachers to be at a fully adequate level, digital literacy courses and tutorials should be offered to primary school teachers in education faculties and private and public schools affiliated with the Ministry of National Education. It should be remembered that a person cannot teach something they do not know. Universities and non-governmental organizations should organize free tutorials on using Web 2.0 tools and integrating technology into the classroom environment for primary school teachers who want to increase their digital literacy level. These courses should be offered to those with more service by looking at their years of seniority in the profession. Through positive discrimination, laptops should be provided to or purchased by teachers from all branches, especially female preschool and primary school teachers, which was the application within the scope of the Movement to Increase Opportunities and Improve Technology (FATIH) Project in Education. Thus, necessary action should be taken to create a flexible classroom environment in education and spread it to all fields of life. As in the case of Finland, digital development should become state policy. EBA-like educational practices should be supported by the state and their number should be increased, and students and teachers should be offered this free of charge. A sharing environment such as the e-twinning portal, which is supported by the European Union and used in Turkey, should be developed within the scope of domestic and national opportunities, and presented to be used by the teacher community, and best practices in education should be made more visible in the country. This method will serve equality of opportunity in education. The study was carried out only with the primary school teachers on duty. Similar studies can be carried out with different branches or online at the national level. In this way, it will be possible to compare the differences between branches. This study was designed with the mixed method, but the quantitative method was dominant. Qualitative methods can be applied to obtain more opinions from teachers and their work. The study was planned and implemented to be carried out together with the teachers. A study that will bring together the three pillars of education can be planned by asking the opinions of families and children.

**Contribution Rate of Researchers Statement:**
This research is the master thesis of the first author, conducted under the supervision of the second author. Both authors contributed to the article. The pattern and process of the research were co-designed by the authors.

**Ethics and Consent:** Ethics committee approval for this study was received from the Ethics Committee of Eskişehir Osmangazi University (Date: 10/10/2019; Approval Number: 64075176-299-E.115566, Decision Number: 2019.15.08).

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