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Factors affecting digital literacy of human resources

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Abstract. Digital literacy is among the major competencies of a company's human resources revealing the relationships of individuals with digital tools. However, an essential premise in studying digital literacy is the level of individuals' readiness for technology. The paper aims to determine the impact of technology readiness on digital literacy, and to establish the characteristics of information society using the case of Turkey. Methodologically, the study rests on the concepts of digitalization, information technology, as well as industrial and information society. Factor, correlation, regression and reliability analyses, and descriptive statistics were used. Using a convenience sampling technique, the authors collected survey results from a sample of 523 individuals aged 18–75. The data were analysed in the SPSS 25 program. The research provides a profile of the Turkish population's digital literacy and technology readiness. According to the findings, the respondents were optimistic about using technology; they were innovative, and do not hesitate to use new technologies. Their digital information literacy and perception of security on digital platforms were high, and they could use digital platforms at a reasonable level. The hypothesis that employees' technology readiness positively affects their digital literacy has been confirmed. The research findings will be useful in determining digital literacy of individuals in the external environment.

Keywords: digital literacy; technology readiness; digitalization; human resources; digital competency; motivating factors; blocking factors; Turkey.

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Факторы влияния на уровень цифровой грамотности человеческих ресурсов

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Аннотация. Цифровая грамотность – одна из основных компетенций человеческих ресурсов компании, показывающая способность работника использовать инструменты цифровой среды. Важной предпосылкой в рассмотрении данного феномена является анализ технической зрелости индивида, т. е. его готовности к применению новых технологий во всех сферах жизни. Статья посвящена изучению влияния уровня технической зрелости населения на цифровую грамотность и выделению характерных особенностей информационного общества на примере Турции. Методологической основой работы послужили концепции цифровизации и информационных технологий, а также постиндустриального и информационного общества. Методы исследования – факторный, корреляционный и регрессионный анализ, оценка надежности и метод описательной статистики. Информационную базу составили результаты опроса 523 респондентов в возрасте 18–75 лет. Обработка полученных данных осуществлялась с помощью статистического пакета SPSS 25. По итогам исследования составлена характеристика уровня цифровой грамотности и технической зрелости населения Турции. Так, установлено позитивное отношение респондентов к внедрению и применению новых технологий. Отмечены их инновационный подход к данному процессу и высокий уровень навыков использования цифровых платформ. Подтверждена гипотеза о том, что уровень технической зрелости работников оказывает положительное влияние на их цифровую грамотность. Результаты исследования сохраняют свою актуальность при определении уровня цифровой грамотности населения во внешней среде.

Ключевые слова: цифровая грамотность; техническая зрелость; цифровизация; человеческие ресурсы; цифровые компетенции; мотивирующие факторы; блокирующие факторы; Турция.

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INTRODUCTION

Knowledge is the driving force behind the development and change processes of societies; it is the basis of technological, socio-cultural, political, and economic changes throughout history. The basis of the change and development process experienced from the beginning of human history to the present day can be associated with the quantity and quality of the information produced. Information and communication technologies, which have been developing rapidly since the early 2000s, have revolutionized the methods used by individuals to access information. This has led to the fact that information production has accelerated, the information produced has affected the development of new technologies, and developing technologies have increased the quality and quantity of the information produced. This situation can be expressed as a loop. The speed of the said cycle is also an important factor affecting the development levels of societies in today's world. Therefore, the period we are in is the information age, and the societies that are successful in the mentioned cycle are defined as the information society [Selvi, 2012; Arklan, Taşdemir, 2008].

The technology-related transformation in information processes has also changed the human profiles needed in almost every part of modern society. With digitalization, all processes related to information are carried out through digital platforms and technological devices. Therefore, individuals who can keep up with the information age should be able to use information intensively and successfully in decision-making processes or solve the problems they may encounter. The effective use of information is directly associated with an individual's digital literacy level[1].

Digital literacy is a concept that emerged with the development and widespread use of the Internet and technological devices in all areas of daily life as a requirement of the age we live in. However, digital literacy should not be perceived as using a technological or digital platform. Similar to information literacy, digital literacy refers to individuals' information in digital environments, access, management, evaluation (quality and validity), creation and analysis of new information, and the choice and use of the right platforms that can meet the needs of daily life (communication (social media, etc.), education, business, etc.) [Gilster, 1997; Livingstone, Van Couvering, Thumim, 2005; Ng, 2012].

In addition to the development of information and communication technologies, other reasons for digital literacy come to the fore. One of these reasons is the existence of technologies such as the Internet of Things, artificial intelligence, big data, blockchain, and cyber-physical systems, which form the basis of the Fourth Industrial Revolution projection called Industry 4.0, which was put forward in 2011 [Lasi et al., 2014]. It can be seen that the planned industrial revolution will be Internet-based, considering this situation. As in many countries, studies on digital transformation have been carried out in Turkey. Digital transformation was emphasized in Turkey's 11th Development Plan, and the technologies that form the basis of Industry 4.0 were mentioned[2]. Although countries or institutions are carrying out activities for digital transformation, it raises the question of how ready societies/individuals are for digital transformation.

In recent digitalization and digital literacy studies, it is seen that individuals assume that they are also digitally literate because they capable of using technology. Thus, the level of using new technologies may not show that individuals are digitally literate at the same time. This assumption ignores the factors related to the social effects, social and economic level of societies. In addition, it reduces digital literacy to the level of using only basic technologies.

Finally, organizations often select the human resources they need from their communities. Society's high level of digital literacy enables the company to reach competent human resources efficiently. The limited digital capabilities of the society near the organization may cause the organization to have an insufficient pool of candidates. It will be costly for organizations to reach appropriate human resources in such a case.

This research aims to determine the level of digital literacy and technology readiness of individuals in Turkey, considering these factors. In addition, it focuses on how much of the technology readiness level of individuals explain their digital literacy. The results are expected to identify individual elements that will contribute to the development of digital literacy. Moreover, technology readiness and digital literacy framework will be brought closer. The research results demonstrate what human resources managers should focus on in terms of digital literacy in the selection process of employees and candidates. The results can also be helpful for HR managers to identify and develop employees' digital competencies.

THEORETICAL APPROACHES AND CONCEPTUAL FRAMEWORK

The concept of digital literacy has been defined by Eshet-Alkalai [2004] as "the ability to survive in the digital age." Ng [2012] stated that adapting to existing and new technologies is an indicator of digital literacy. The spread of digitalization in all areas of life necessitates individuals to keep up with the digitalized age. This situation is possible when individuals acquire skills related to digital literacy. Eshet-Alkalai [2004] stated that digital literacy includes five different types of literacy: Photo-visual; Reproduction; Information; Branching, and Socio-emotional literacy. In the study conducted by Aviram and Eshet-Alkalai [2006], real-time thinking skills were included in addition to the five dimensions mentioned above. Real-time thinking ability is expressed as processing and evaluating large

[1] European Commission. (2018). Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions on on the Digital Education Action Plan. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2018:22:FIN; Digital Literacy European Commission. (2008). Digital literacy report: A review for the i2010 eInclusion Initiative. https://ifap. ru/library/book386.pdf.

[2] 11th Development Plan. (2019). https://www.sbb.gov.tr/wp-content/2019/07/OnbirinciKalkinmaPlani.pdf.

volumes of information in real-time, such as computer games and online communication platforms. The literacy types mentioned show complexity in the background of the concept of digital literacy. In addition, the dimensions of the concept are expanding daily.

Even so, Ng [2012] developed a new approach/model specific to the dimensions of digital literacy. In Ng's study, Eshet-Alkalai's [2004] and the New London Group's studies were combined and examined the concept of digital literacy by reducing it to three dimensions[1]. These dimensions are technical, cognitive, and social-emotional. Technical dimension: individuals have the necessary technical skills to use information and communication technologies in daily life. The cognitive dimension covers the processes of searching, evaluating, and processing information in digital environments and is associated with the ability to think critically. The social-emotional dimension refers to the responsible use of the Internet in activities carried out to socialize and obtain information/learning [Ng, 2012].

Digital literacy is shaped according to the technological and digital transformation process brought about by age. Individuals can be digitally literate with the acquisition of many skills. Considering the sub-dimensions of the concept stated in the studies conducted by Eshet-Alkalai [2004] and Ng [2012], it can be seen that individuals should have many literacy skills. Since digital literacy is directly related to using technological devices and digital platforms, it raises the question of how ready individuals are to use these technologies. At this point, the desire (preparation) of individuals to use new technologies gains importance. It is essential to determine the factors that prevent individuals from adapting to innovations brought by technology. Determining the technology readiness level of individuals prior to the adaptation process to technology can effectively reduce the factors that may adversely affect the adjustment process and productivity [Clausing, Holmes, 2010]. The National Aeronautics and Space Administration (NASA) introduced the concept of technology readiness in 1970. Over time, the US Congress' General Accountability Office (GAO) also started using concept of technology readiness. It has also been applied effectively by the Department of Defense (DOD) [Markins, 2009]. Lin, Shih and Sher [2007] define technology readiness as the tendency of individuals to adopt and use new technologies in their business and social lives. Technology readiness refers to the blocking and motivating factors of an individual's predisposition to technologies. Parasuraman [2000] carried out one of the most inclusive approaches to technology readiness. This approach is based on four main dimensions: optimism, innovation, discomfort, and insecurity. Individuals' belief that technologies will add more control, efficiency, and flexibility to their lives is a dimension of optimism. Innovation is the state of individuals having a natural desire to use new technologies and being thought of as leaders in using technologies. Optimism and innovation are the motivating factors for technology readiness. Discomfort is an individuals' feeling of not having control over technologies and a lack of confidence in using technologies. Distrust is the lack of confidence that technological products, processes, or services will work properly. Insecurity and discomfort are blockings to technology readiness [Parasuraman, 2000; Meng, Elliott, Hall, 2009; Rojas-Mendez, Parasuraman, Papadopoulos, 2017].

Some approaches to explaining individual innovations and accepting behaviours have been developed in the literature. This includes the theory of reasoned action [Ajzen, Fishbein, 1980], the theory of planned behaviour [Ajzen, Madden, 1986], the technology acceptance model [Davis, 1985, 1989], extended technology acceptance model [Venkatesh et al., 2003], and recently created technology readiness [Parasuraman, 2000].

The theories of reasoned action and planned behaviour provide general inferences about individual behaviour [Ajzen, Fishbein, 1980; Ajzen, Madden, 1986]. For technology adoption, the approaches of technology acceptance, extended technology acceptance, and technology readiness are used [Venkatesh et al., 2003]. The technology preparation approach is included in the research because technology readiness defines the motivating and impeding factors that influence individuals' adoption of technologies via individual factors, which is appropriate for defining general technology readiness.

In the literature, it has not been determined to what extent technology readiness explains digital literacy. Another reason to use the technology readiness approach is that the factors in technology acceptance models typically produce more specific results for a technology (smartphone, mobile applications, service applications, etc.) [Liljander et al., 2006; Meuter et al., 2005; Dabholkar, Bagozzi, 2002]. Individuals' attitudes towards technology in general can be measured using technology readiness measurement tools. As a result, the concepts of digital literacy and technological readiness were introduced into this study for the first time. The literature is summarized and hypotheses are presented in the following section.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The concept of literacy refers to an individual's literacy and ability to access, evaluate, use appropriately, and produce new information with the information obtained [Bruce, 1999]. However, the increase in the speed of access with technological change has become a critical issue regarding access to correct data and the appropriate use of the accessed information. This process of knowledge has gained importance by keeping up with the digital age of today's societies, even though it was at the centre of

[1] New London Group. (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review*, vol. 66, no. 1, pp. 60–92.

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life before technological transformation [Nikou, Brännback, Widén, 2019]. Despite the possibility of obtaining unlimited information brought about by the digital age, processes such as reliability, evaluation, and processing of the obtained data require various literacy skills. This explains why the concept of digital literacy is expressed as "survival in the digital age" [Eshet-Alkalai, 2004].

Digital literacy is important for the socio-economic development of society and workforce employment. It is a skill that should be possessed not only by technical personnel operating in informatics but also by people in the labour market. Digital literacy and digital abilities have become factors that affect the business environment and the social relations of individuals [Bejaković, Mrnjavac, 2020].

Individual belief structures have an impact on digital literacy. Behaviours, norms, and control beliefs positively affect digital competencies and digital literacy. The fact that individuals have a high perception of control also increases their motivation to acquire skills in digital media [Sadaf, Johnson, 2017]. Optimists are less likely to focus on negative events and, therefore, confront technology more openly. They are more likely to accept their situation and are less likely to escape reality. Therefore, optimists are more willing to use new technologies [Scheier, Carver, 1987]. Thus, optimism leads to more positive attitudes and helps to develop more positive attitudes toward computers [Loyd, Gressard, 1984; Munger, Loyd, 1989]. Therefore, it can be assumed that optimistic people perceive technology as more useful and easier to use because they worry less about possible negative consequences. In addition, individuals' perception of technological or digital tools as easy to use, valuable, and high-quality creates motivation for individuals to use technological elements [Lin, Shih, Sher, 2007; Blut, Wang, 2019]. Individuals' high degree of readiness for technological elements provides emotional and cognitive proximity to technological elements [Ferreira, Rocha, Silva, 2014; Godoe, Johansen, 2012]. Individuals' positive evaluations of technological elements create a positive motivation in terms of using digital tools. According to the scientific literature, positive judgments of individuals about technology motivate cognitive, social, and technology use [Lam, Chiang, Parasuraman, 2008; Liljande et al., 2006; Geng, Law, Niu, 2019]. When the research results are examined, it is possible to predict that the technology readiness level of individuals will positively affect their digital literacy. Therefore, the proposed hypotheses are as follows:

H1: Motivating factors affect cognitive literacy.

H2: Motivating factors affect social-emotional literacy.

H3: Motivating factors affect technical literacy.

Buchanan, Sainter and Saubders [2013] concluded that the technology use competence of individuals and the negative factors related to technology use affect the adaptation of individuals to technological innovations. Individuals' negative perceptions reduce their level of technology use when considered in terms of digital skills development and digital literacy, the individual's self-efficacy [Bandura, 1982; Sadaf, Gezer, 2020], easy access to technological tools [Taylor, Todd, 1995], and the blockings and risks when using technology [Çam, Kıyıcı, 2017]. It is effective for the development of people's digital literacy. The negative judgments of individuals towards technologies reduce the level of adoption of digitalization [Kuek, Hakkannes, 2020]. In the literature, the tendency to determine the level of digital literacy is relatively high. The researchers in question are mostly students, educators, employees, customers, etc. [Çetin, 2016; Üstündağ, Güneş, Bahçivan, 2017; Geng, Law, Niu, 2019; Kozan, Özek, 2019; Can, Çelik, Çelik, 2020; Liljande et al., 2006]. Thus, the hypotheses of the research are as follows:

H4: Blocking factors affect technical literacy.

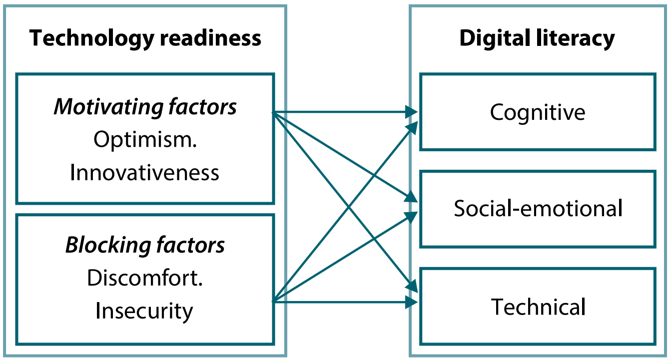
H5: Blocking factors affect cognitive literacy.

H6: Blocking factors affect social-emotional literacy.

RESEARCH METHODOLOGY

Next, we present the information about the purpose of the research, the important aspects of the findings to be obtained, the sampling technique used in the study, and the sampling characteristics and the data collection process.

Research model. According to Figure, the motivating and blocking factors of technology readiness represent the independent variables (*x*), while digital literacy's cognitive, social-emotional, and technical dimensions represent the dependent variable (*y*).



Conceptual model of the study
Концептуальная модель исследования

Purpose and importance of the research. The technology readiness level expresses the tendency of individuals to adopt and use technologies throughout their lives [Parasuman, 2000]. Technology readiness level is a mental process that prevents and supports factors that come together in individuals' use of technology [Lin, Shih, Sher, 2007]. Blocking factors are discomfort and insecurity while motivating factors include optimism and innovation [Blut, Wang, 2019]. Nowadays, when digitalization is being talked about frequently, it is important for individuals to be ready for the use of technology in order for digitalization to take place healthily. In the literature, it is seen that there is a general assumption in studies on adaptation to the digital world. The level of acceptance of new technologies has been associated with digital literacy [Ng, 2012]. Although this idea is accepted empirically, we created a new discussion topic in this study. Research on the adoption of new technologies is explained by models such as the technology acceptance model and extended technology acceptance model [Venkatesh, Thong, Xu, 2016]. These models provide good performance for the use of new technologies. However, although these models provide results in measuring a technology or technology group as mentioned, they create question marks in measuring general technology usage trends. Within the scope of this research, we associate individuals' level of readiness for technologies with digital literacy, unlike the literature [Marinho et al., 2014; Mohammadyari, Singh, 2015; Hanif, Jamal, Imran, 2018; Scherer, Siddiq, Tondeur 2019]. We aim to determine how the blocking and motivating factors that make up the technology readiness levels of individuals affect digital literacy. Thus, the technology readiness levels of individuals living in Turkey will be determined, and inferences will be reached regarding how the technology readiness level affects digital literacy. In addition, we will try to gain a new discussion area in the literature on digital literacy.

Sample of the research and sampling method. The sample of the study included individuals aged 18–75 years living in Turkey. A convenience sampling technique was used to determine the sample size, providing time and cost savings [Koç Başaran, 2017]. In addition, it creates a weakness for each sample to be included in the study. However, it was considered appropriate to cover many social segments in the research. Thus, the sample was distributed according to education level, age range, income level, employment status, sector, duration of use of technological devices, and locations. Online questionnaires were used within the scope of this study based on volunteering to complete the questionnaire. The answers of the participants who did not participate voluntarily were deemed invalid. Of 622 individuals who responded to the questionnaire, 523 fully participated in the study. The answers of 99 individuals were not included. Hair et al. [2014] used a sample constraint of 10 per commonly used item to determine the number of samples to be reached in the research. It was concluded that the sample was sufficient considering the 29 items used in this study. Another reason for not increasing the sample is that in very high samples, meaningless relationships become meaningful due to the increase in the number of samples [Hair et al., 2014].

It was determined that 61.6 % (322 people) of the 523 interviewees who participated in the study were female; 36.7 % (192 people) were men; and 1.7 % (9 people) did not specify their gender. The fact that the participants are predominantly women may be due to the research topic that attracts women's attention or that women are more willing to participate in the study. Moreover, most of the participants are 25–44 years old (62.2–325 people); 95.3 % of them had a university or higher education, and 4.7 % (25 people) had a high school or lower education level; 71.1 % (372 people) have a job. The education, health, and service sectors stand out as the most common sectors for our sample with 43.8 % (229 people). The use of technology and the duration of use of technological devices are important issues in determining the level of digital literacy, which is the main subject of the research. As a matter of fact, 53.9 % (282 people) of the participants stated that the time they spent on technological devices was between 5 and 9 hours, and 21 % (110 people) stated that they spent 10 hours or more. According to the *Digital 2021* report prepared in cooperation with *We Are Social and Hootsuite*, the average time spent online (including all devices) by internet users between the ages of 16 and 64 globally is 6 hours 54 minutes.[1] The aforementioned report was also made specific to Turkey, and it was determined that the average time spent on the Internet (including all devices) by people aged 16–64 in Turkey is 7 hours 57 minutes.[2] Therefore, we think that a significant share of the participants included in the research has internet usage time above the world average.

Measurement tools used in the research. A substantial number of studies have been carried out to measure the level of digital literacy. The aim of the research is to measure the digital literacy levels of the participants who will be included in the study in a wide scope. In this context, a literature review was conducted and Ng [2012], Alt and Raichel [2020], Kaeophanuek, Na-Songkhla and Nilsook [2018], and Mancha and Shankaranarayanan [2020] digital literacy scale was prepared by compiling the scales used in the studies. In addition, in the creation of the Turkish form of the scale, Çetin [2016], Hamutoğlu et al. [2017], Ocak and Karakuş [2019] and Çağlıyan and Doğanalp [2020] were used. In addition, the scale has high reliability (Cronbach's Alpha = 0.984 to 0.835) in different studies [Çetin, 2016; Hamutoğlu et al. 2017; Çağlıyan, Doğanalp, 2020; Ng, 2012; Alt, Raichel, 2020; Mancha, Shankaranarayanan, 2020] and validity values (Kaiser Meyer Ohlin (KMO) = 0.887 to 0.910) [Hamutoğlu et al. 2017; Çağlıyan, Doğanalp, 2020; Mancha, Shankaranarayanan, 2020]. In the digital literacy scale, there are three sub-dimensions: cognitive, social-emotional and technical [Ng, 2012]. There are 13 items on this scale, one of which is a control question: the cognitive dimension consists of five items; and the social-emotional dimension and the technical dimension consist of four items each. In addition, one control question was used in the questionnaire form. The technology readiness scale used in the research was developed by Parasuraman [2000] and adapted by Par-

[1] Digital 2021. Your ultimate guide to the evolving digital world. https://wearesocial.com/digital-2021.

[2] Digital 2021: Turkey. https://datareportal.com/reports/digital-2021-turkey.

asuraman and Colby [2015]. There were 16 items in the adapted measurement tool. Technology Readiness Levels consist of optimism (4 items) and innovativeness (4 items) dimensions that explain the motivational feelings of the participants about technology, and the dimensions of discomfort (4 items) and insecurity (4 items) that define the factors that block the participants.

RESEARCH FINDINGS

Factor analysis, reliability analysis, descriptive statistics, normal distribution tests, correlation, and regression analysis are included in this section. The analyses made within the scope of the research were designed in accordance with the research purpose and model.

Factor analysis and reliability analysis results. Factor analysis was conducted to test whether the measurement tools used in the research were tested with appropriate samples, the sample size's adequacy, the scales' distribution to relevant factors, and the adequacy of the explanatory power of the measurement tools. In the evaluation of factor analysis results, Hair et al. [2014] and widely accepted limit values in the literature were used; Kaiser-Meyer-Olkin's (KMO) value was 0.70, Bartlett's sphericity test value was $p < 0.05$, and the total variance explained was 60 %. A value of 0.40 was used for factor loading scores. In addition, the varimax rotation technique was used to ensure the proper distribution of the items in the measurement tool. Reliability analysis was conducted to determine the reliability of the measurement tools used in the research and the appropriateness of the participants' answers. Cronbach's alpha coefficient was applied in the reliability analysis. A limit value of 0.70 was used in interpreting the reliability coefficients [Hair et al., 2014].

The factor analysis results of the technology readiness index used in this study are presented in Table 1. When the values were examined, it was observed that the KMO value of the technology readiness scale was 0.772, Bartlett's sphericity test was $p < 0.05$, the total variance explained was 60.55 %, and as a result of the rotation, the measurement tool was divided into four factors. As a result of the factor analysis, the item "I doubt that the people who provide support will benefit from me while receiving technical support on technology" was excluded from the scope of the research because it provided attribution to

Table 1 – Factor analysis and reliability analysis results of participants' technology readiness scale
Таблица 1 – Результаты факторного анализа и оценки надежности шкалы технической развитости респондентов

Rotated component matrix				
Question	Components			
	Innovativeness	Optimism	Discomfort	Insecurity
I can usually figure out new high-tech products and services without help from others (Q7)	0.827	–	–	–
Other people come to me for advice on new technologies (Q5)	0.814	–	–	–
In general, I am among the first in my circle of friends to acquire new technology when it appears (Q6)	0.760	–	–	–
I keep up with the latest technological developments in my areas of interest (Q8)	0.751	–	–	–
Technology gives me more freedom of mobility (Q2)	–	0.779	–	–
Technology makes me more productive in my personal life (Q4)	–	0.764	–	–
Technology gives people more control over their daily lives (Q3)	–	0.764	–	–
New technologies contribute to a better quality of life (Q1)	–	0.743	–	–
Sometimes, I think that technology systems are not designed for use by ordinary people (Q11)	–	–	0.819	–
There is no such thing as a manual for a high-tech product or service that's written in plain language (Q12)	–	–	0.799	–
Technical support lines are not helpful because they don't explain things in terms I understand (Q10)	–	–	0.649	–
Technology lowers the quality of relationships by reducing personal interaction (Q15)	–	–	–	0.786
Too much technology distracts people to a point that is harmful (Q14)	–	–	–	0.713
People are too dependent on technology to do things for them (Q13)	–	–	–	0.644
I do not feel confident doing business with a place that can only be reached online (Q16)	–	–	–	0.486
Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.772, Bartlett's Test of Sphericity = 0.000, Approx. Chi-Square = 2337,904 Df = 105, Total variance explained = 60,556 (optimism = 17,695, innovativeness = 17,604, discomfort = 12,873, insecurity = 12,385), Cronbach's Alpha = 0.771, item = 15 (the coefficient is among 0.749–0.779)				

more than one factor. Since the factor loading values of the other items were above 0.40, and the distributions were in accordance with the examples in the literature, no other item was eliminated. When the reliability values of the technology readiness index were examined, it was observed that Cronbach's alpha coefficient was 0.771, there were 15 items in the reliability analysis of the scale, and the reliability coefficient of the scale did not increase significantly, when the items were deleted. All findings considered, it can be stated that the technology readiness index is a sufficiently reliable measurement tool.

The factor analysis results of the digital literacy scale used in this study are presented in Table 2. It was seen that the KMO value of the digital literacy scale was 0.852, Bartlett's sphericity test was $p < 0.05$, the total variance explained was 56.29 %, and as a result of the rotation, it was determined that the measurement tool was divided into three factors. As follows from the factor analysis, the item "I am aware of the advantages, disadvantages, and effects of using digital platforms" was excluded from the scope of the research because it provided factor distribution on its own. Since the factor loading values of the other items were above 0.40, and the distributions were in accordance with the examples in the literature, no other item was eliminated. When the reliability values of the digital literacy scale were examined, it was observed that Cronbach's alpha coefficient was 0.821, 12 items were included in the reliability analysis of the scale, and the reliability coefficient of the scale did not increase significantly when the items were deleted. All findings considered, it can be stated that the digital literacy scale is a reliable measurement tool.

Correlation and regression analysis. We used correlation analysis to determine the interrelationships between individuals' perceptions of technology readiness and their digital literacy. Moreover, we also conducted regression analysis to examine the effect of technology readiness levels on digital literacy. Pearson coefficient was employed in the correlation analysis. The most important assumption in using the Pearson coefficient is that the data has a normal distribution. In order to test the normal distribution of the data, we performed Kolmogorov-Smirnov and Shapiro-Wilk tests. As a result, we found that the normal distribution values were $p < 0.05$, which addresses that our data is not normally distributed. Moreover, we also checked for the skewness and kurtosis values, following George and Mallery [2010], Tabachnick and Fidell [2013], Hair et al. [2014]. The skewness and kurtosis values of the data were estimated between around –2.0 to 2.0, which met the threshold values for using parametric test, such as Pearson correlation and regression tests, even though the data is not normally distributed.

The means and standard deviations of our variables are shown in Table 3. As can be seen, the optimism and

Table 2 – Factor analysis and reliability analysis results of digital literacy scales
Таблица 2 – Результаты факторного анализа и оценки надежности шкалы цифровой грамотности

Rotated component matrix			
Question	Components		
	Cognitive	Social-emotional	Technical
I know the methods that can be used to protect my personal data on the Internet (Antivirus programs, 3D Secure, two-factor authentication, etc.) (Q8)	0.733	–	–
I can prepare new content, presentation, report or video with the information I have gained from digital platforms (Q6)	0.669	–	–
I can choose and use the most suitable digital platform to communicate according to my needs (WhatsApp, Discord, Telegram, Skype, Teams, Zoom etc.) (Q13)	0.651	–	–
I have the technical knowledge to create my own blog or website (Q12)	0.631	–	–
Usually, I know how to access online databases (academic databases or public databases) (Q14)	0.617	–	–
I can decide whether the information I receive from a digital platform is reliable (Q3)	–	0.834	–
Before using it, I pay attention to the reliability of information sources (Q2)	–	0.778	–
I can define and use keywords when searching for information on digital platforms (Q4)	–	0.593	–
I can distinguish correct information from misleading information or comments on digital platforms (Q5)	–	0.587	–
I can use digital platforms in my financial transactions such as money transfer and bill payment (Q10)	–	–	0.783
I can send and receive files/mails via digital platforms (Hotmail, Gmail, Yahoo, Outlook etc.) (Q1)	–	–	0.767
I can use digital platforms to buy or sell something (Q9)	–	–	0.500
Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.852, Bartlett's Test of Sphericity = 0.000, Approx. Chi-Square = 1696,015, Df = 66, Total variance explained = 56,296 (Technical = 23,478, Social-emotional = 18,672, Cognitive = 14,145), Cronbach's Alpha = 0.821, item = 12 (the coefficient is among 0.792–0.820)			

Table 3 – Correlation analysis results
Таблица 3 – Результаты корреляционного анализа

Variable	Mean	S. D.	Optimism	Innovativeness	Discomfort	Insecurity	Cognitive	Social-emotional	Technical	Digital literacy
Optimism	4.0798	0.76280	1							
Innovativeness	3.4847	0.91745	***0.357****	1						
Discomfort	2.9280	0.96099	***0.139****	0.083	1					
Insecurity	2.0913	0.77010	***0.242****	***0.145****	***0.338****	1				
Cognitive	4.7916	0.38339	***0.176****	***0.220****	***0.135****	***0.094****	1			
Social-emotional	4.3227	0.63557	0.289**	***0.441****	0.057	0.010	***0.360****	1		
Technical	4.0803	0.70606	***0.250****	***0.580****	***0.175****	0.056	***0.415****	***0.542****	1	
Digital literacy	4.3389	0.49619	***0.306****	***0.575****	***0.155****	0.056	***0.593****	***0.818****	***0.905****	1
Technology readiness	3.1605	0.54410	0.675**	0.667**	0.570**	0.652**	0.248**	0.330**	0.438**	0.448**
(*) Sig. $p < 0.05$ level, (**) Sig. $p < 0.01$ level, N: 523										

innovativeness perceptions of the participants are very high, while their perceptions of discomfort about technologies are unstable, and their insecurity perceptions are low. It is possible to say that the level of technology readiness is generally at the level of indecision. We come to a conclusion that the participants generally feel ready for the technology. When the findings of the participants' digital literacy are examined, we see that the cognitive and social-emotional dimensions are at a very high level, while the technical dimension is at a high level. It is possible to state that the participants have a very positive approach to their general digital literacy levels. Finally, the standard deviation values of the responses given to the items in the measurement tools do not seem to be high, thus the mean values can be considered as appropriate.

The results of the correlation analysis are given in Table 3. There is a moderate, positive, and statistically significant ($p < 0.05$) relationship between the level of technology readiness and digital literacy. Moreover, Table 3 shows that there are a very low and positive relationship between people's optimism towards technologies and (i) cognitive dimension, (ii) the social-emotional dimension, and (iii) technical dimension. In addition, there is a low level of relationship between people's innovative tendencies towards technologies and the cognitive dimension, while there are moderate relationship between people's innovative tendencies towards technologies with the social-emotional and technical dimensions. We also found that there is a very low level of relationship between individuals' discomfort with technologies and the cognitive and technical dimensions. Finally, there is a very low and positive significant relationship between people's feelings of distrust towards technologies and the cognitive dimension.

Interestingly, the correlation analysis provided no significant evidence in support of a significant association between the discomfort and the social-emotional dimension, and between individuals' feelings of insecurity towards technologies and the social-emotional and technical dimensions. In the next part, we conducted a regression analysis regarding the effects of the technology readiness level on digital literacy. Variables that did not have a significant relationship were not used in the regression analysis.

The results of the regression analysis, performed to determine the effect of the technology readiness level on digital literacy, are given in Table 4. The findings show

Table 4 – Regression analysis results
Таблица 4 – Результаты регрессионного анализа

Independent variables	Dependent variables	R^2	Adjusted R^2	Durbin-Watson	Constant B	Std. Coeff. (Beta)	Sig.
Technology readiness	Digital literacy	0.201	0.199	1.883	3.047	**0.448****	**0.000**
Optimism	Cognitive	0.071	0.063	1.865	4.206	**0.097***	**0.038**
Innovativeness						**0.176****	**0.000**
Discomfort						**0.104***	**0.022**
Insecurity						0.010	0.832
Optimism	Social-emotional	0.214	0.211	1.883	2.876	**0.150****	**0.000**
Innovativeness						**0.387****	**0.000**
Optimism	Technical	0.354	0.350	1.880	2.190	0.034	0.371
Innovativeness						**0.557****	**0.000**
Discomfort						**0.124****	**0.001**
(*) Sig. $p < 0.05$ level, (**) Sig. $p < 0.01$ level							

that the technology readiness level explains 19.9 % of the change in individuals' digital literacy level. The model (Anova, 0.000 < 0.050) seems to be statistically significant. When the coefficients are examined, we see that the coefficient of the constant value (B) is 3.047, and the coefficient of the technology readiness level (standardized beta) is 0.448. The effect of technology preparation level on digital literacy is significant at the $p < 0.050$ level. The formulation of the effect of technology readiness level on digital literacy is $y_i = \beta_0 + \beta_1 x_{i1} + \varepsilon_i$. When the values are placed in the formula, it is

$$y_{\text{digital literacy}} = 3.047 + 0.448x_{\text{technology readiness level}} + 0.115.$$

Accordingly, the results of the regression analysis reveal that individuals' level of readiness for technology use positively affects their digital literacy.

Table 4 shows the results of the regression analysis performed to determine the effect of the sub-dimensions of the technology readiness level on the cognitive dimension. The findings reveal that reliability, innovativeness, discomfort, and optimism together explained 7.1 % of change in the cognitive dimension level of individuals. The model (Anova, 0.000 < 0.050) seems to be statistically significant. Regarding the coefficients, the findings show that coefficient of the constant value (B) was 4.206, while the coefficients of the independent variables (standardized beta) are as follows: optimism was 0.097, innovation was 0.176, discomfort was 0.104. We could not find a statistically significant association between distrust and the cognitive dimension. The effect of the sub-dimensions of the technology readiness level on the cognitive dimension is formulated as $y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \beta_3 x_{i3} + \varepsilon_i$. When the values are placed in the formula,

$$y_{\text{cognitive}} = 4.206 + 0.097x_{\text{optimism}} + 0.176x_{\text{innovativeness}} + 0.104x_{\text{discomfort}} + 0.102.$$

Accordingly, H1 is fully and H5 is partially supported.

Table 4 shows the results of the regression analysis performed to determine the effect of the sub-dimensions of the technology readiness level on the social-emotional dimension. The findings demonstrate that innovativeness and optimism together explained 21.1 % of the change in individuals' social-emotional level. The model (Anova, 0.000 < 0.050) seems to be statistically significant. Regarding the coefficients, the findings show that coefficient of the constant value (B) was 2.876, while the coefficients of the independent variables (standardized beta) are as follows: optimism was 0.150, and innovation was 0.387. The effect of the sub-dimensions of the technology readiness level on the social-emotional dimension is formulated as $y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \varepsilon_i$. When the values are placed in the formula,

$$y_{\text{social-emotional}} = 2.876 + 0.150x_{\text{optimism}} + 0.387x_{\text{innovativeness}} + 0.143.$$

Accordingly, while H2 was supported, H6 was rejected.

Table 4 also shows the results of the regression analysis performed to establish the effect of the sub-dimensions of the technology readiness level on the technical dimension. The findings demonstrate that optimism, innovation, and comfort together explain 35 % of change in the technical dimension level of individuals. The model (Anova, 0.000 < 0.050) seems to be statistically significant. Regarding the coefficients, the findings show that coefficient of the constant value (B) was 2.190, while the coefficients of the independent variables (standardized beta) appear to be as follows: innovativeness was 0.557, and discomfort was 0.124. However, the results of the regression analysis provide no empirical evidence supporting a statically significant association between optimism and the technical dimension. The effect of the sub-dimensions of the technology readiness level on the technical dimension is formulated as $y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \varepsilon_i$. When the values are placed in the formula, it is

$$y_{\text{technical}} = 2.190 + 0.557x_{\text{innovation}} + 0.124x_{\text{inconvenience}} + 0.155.$$

Accordingly, H3 and H4 were partially supported.

CONCLUSION

For digitalization to occur at the social level healthily, individuals need to be ready to use technology. In studies on digitalization, it has been observed that the technology readiness levels of individuals are not adequately examined. Generally, the level of acceptance of new technologies is associated with digital literacy. At this point, we created a new discussion. Within the scope of this research, we associate individuals' level of readiness for technologies with digital literacy. We aim to determine how the blocking and motivating factors that make up the technology readiness levels of individuals affect digital literacy.

Within the scope of the research, the following findings have been revealed. Individuals are optimistic about the use of technology, innovative in terms of using new technologies, and not insecure about the use of new technologies. In addition, it was observed that the participants' digital information literacy was very high, their perception of security on digital platforms was high, and they could use digital platforms at a reasonable level.

The existence of motivating factors that encourage individuals to use technology enables them to gain digital cognitive competence. In addition, one interesting finding is that when individuals feel discomfort, their cognitive abilities also increase. It could be that technology-related discomfort activates cognitive activities and, therefore, affects the cognitive literacy of individuals who are disturbed. However, the results of studies on the effect of negative motivation on individual behaviours vary [Shors, 2006; Howland, Wang, 2008; Pakarinen et al., 2010]. The social-emotional literacy of individuals increases with the effect of motivating factors. It can be stated that individuals' positive perceptions about technology cause their digital literacy to be positively affected in terms of communicating effectively and perceiving negativities. Individuals' motivation to use the technology internally will enable them to develop their digital literacy to distinguish the negative consequences of digital technologies (fraud, etc.).

Another finding of the study is that the motivating factors of technology readiness increase technical literacy. The fact that individuals have positive perceptions of technology will make sense and lead them to use digital technologies technically. In addition, technical literacy was found to be positively related to technology discomfort. Interestingly, the fact that individuals are uncomfortable with technology (discomfort, fear, stress, etc.) increases technical literacy, which indicates their tendency to use digital technologies. Considering that negative emotions increase the attention level of individuals [Lupien et al., 2002; Cahill, Gorski, Le, 2003], it can be expected that gaining competence in the use of digital tools will increase.

In addition, research has shown that the negative perceptions of individuals toward technologies are low. The low level of distrust and discomfort perception towards technology may explain why digital literacy is not negatively affected. It should not be forgotten that although there are few results about the negative perceptions of individuals on digital literacy [Buchanan, Sainter, Saubders, 2013; Çam, Kıyıcı, 2017; Sadaf, Gezer, 2020], there is not enough research on the subject.

Our findings on the increase in digital literacy by motivating factors affecting technology readiness are compatible with the literature [Sadaf, Johnson, 2017; Scheier, Carver, 1987; Lin, Shih, Sher, 2007; Blut, Wang, 2019]. All results considered, the level of technology readiness of individuals improves their digital literacy. Enhancing digital literacy at the level of individuals and societies will make the digital world more realistic. Digitalization will occur at different levels in different parts of the world in the future [Maiti, Castellacci, Melchior, 2020]. However, the level of development and digitalization of certain segments of society will be achieved with their readiness for technology. Thus, it will not be possible to achieve digitalization without social and individual readiness for technology.

From the perspective of organizations, having sufficient digital literacy in society will make it easier for the firm to have a suitable candidate pool. Thus, human resources managers will attract candidates that organizations need. The selection of candidates with appropriate digital competencies will help reduce personnel development costs and make it easier for companies to adapt to the digital world. In addition, identifying the factors that hinder and motivate employees' digital literacy will facilitate the development of their digital skills. As a result, it will enhance competitive advantages of organizations.

According to the study's findings, individuals' readiness to use technology increases their digital literacy. However, the findings should be supported by additional research on specific issues. Within the scope of the current work, the sample was not privatized. For example, in studies to be conducted on a professional sample, it can be expected that the level of technology readiness and digital literacy levels will be different, or the direction of their relationships may change. Furthermore, issues such as regional differences and technological investments in countries [Maiti, Castellacci, Melchior, 2020] may cause a shift in the level of technology readiness and digital literacy at the societal level. Moreover, the fact that individuals are educated about the use of technology during their schooling may cause changes in the results obtained.

Finally, cultural structures in national institutions [Rubino et al., 2020] can produce impressive results in terms of individual technology use and digital literacy. The pressures and incentives placed on institutions can help to prepare societies for the digital world [Paul, Upadhyay, Dwivedi, 2020]. These situations can have an impact on digital literacy and should be investigated in terms of digital literacy. As a result, researchers can investigate how the aforementioned factors influence digital literacy.

With the COVID-19 pandemic, the importance of personal protection has led individuals to shop on digital platforms even if they do not want to, to perform banking transactions, employees to hold meetings on digital platforms and turn to remote working options, and training is done on digital platforms. These factors are mostly unconventional and express compelling factors formed as a result of macrosystem and government pressures. However, the compelling factors do not provide enough benefit in increasing individuals' digital literacy. Instead, it should be ensured that people have positive attitudes towards digital tools. It is critical to increasing people's positive attitudes towards digital literacy and technology. Individuals can use technology more effectively if institutions and organizations offer technology and digitalization training. Including digital literacy topics in school curricula [Rubino et al., 2020] and developing digital tool training programs for employees in businesses [Paul, Upadhyay, Dwivedi, 2020] are examples of best practices. ■

References

Ajzen I., Fishbein M. (1975). *Belief, attitude, intention and behavior: An introduction to theory research*. Reading, MA: Addison-Wesley.

Ajzen I., Fishbein M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.

Ajzen I., Madden T.J. (1986). Prediction of goal-directed behavior: Attitudes, intentions, and perceived behavioral control. *Jour-*

nal of Experimental Social Psychology, vol. 22, no. 5, pp. 453–474. https://doi.org/10.1016/0022-1031(86)90045-4.

Alt D., Raichel N. (2020). Enhancing perceived digital literacy skills and creative self-concept through gamified learning environments: Insights from a longitudinal study. *International Journal of Educational Research,* vol. 101, 101561. https://doi.org/10.1016/j.ijer.2020.101561.

Arklan Ü., Taşdemir E. (2008). Bilgi toplumu ve iletişim: bilginin yayılması sürecinde kitle iletişim araçları ve internet [The information society and communicatıon: mass media and internet at the diffusion process of information]. *Selçuk İletişim*, vol. 5, no. 3, pp. 67–80. (in Turkish)

Aviram A., Eshet-Alkalai Y. (2006). Towards a theory of digital literacy: Three scenarios for the next steps. http://www.eurodl.org/materials/contrib/2006/Aharon_Aviram.html.

Bandura A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, vol. 37, no. 2, pp. 122–147. DOI: 10.1037/0003-066X.37.2.122.

Bejaković P., Mrnjavac Ž. (2020). The importance of digital literacy on the labour market. *Employee Relations*, vol. 42, no. 4, pp. 921–932. https://doi.org/10.1108/ER-07-2019-0274.

Blut M., Wang C. (2019). Technology readiness: A meta-analysis of conceptualizations of the construct and its impact on technology usage. *Journal of the Academy of Marketing Science*, vol. 48, pp. 649–669. https://doi.org/10.1007/s11747-019-00680-8.

Bruce C.S. (1999). Workplace experiences of information literacy. *International Journal of Information Management,* vol. 19, no. 1, pp. 33–47. https://doi.org/10.1016/S0268-4012(98)00045-0.

Buchanan T., Sainter P., Saubders G. (2013). Factors affecting faculty use of learning technologies: Implications for models of technology adoption. *Journal of Computing in Higher Education*, vol. 25, pp. 1–11. https://doi.org/10.1007/s12528-013-9066-6.

Çağlıyan V., Doğanalp B. (2020). Dijital okuryazarlık internet girişimciliği niyeti ilişkisi üzerine ampirik bir çalışma [An empirical study on the relationship between digital literacy and internet entrepreneurship intention]. *Pamukkale Üniversitesi İşletme Araştırmaları Dergisi – Pamukkale University Journal of Business Studies*, vol. 7, no. 2, pp. 180–199. DOI: 10.47097/piar.807027. (in Turkish)

Cahill L., Gorski L., Le K. (2003). Enhanced human memory consolidation with post-learning stress: Interaction with the degree of arousal at encoding. *Learning Memory*, vol. 10, pp. 270–274. https://doi.org/10.1101/lm.62403.

Çam E., Kıyıcı M. (2017). Perceptions of prospective teachers on digital literacy. *Malaysian Online Journal of Educational Technology*, vol. 5, no. 4, pp. 29–44.

Can Ş., Çelik B., Çelik C. (2020). Fen bilgisi öğretmen adaylarının dijital okuryazarlık düzeyine çeşitli değişkenlerin etkisi [The effect of various variables on the digital literacy level of science teacher candidates]. *Eğitim Kuram ve Uygulama Araştırmaları Dergisi – Journal of Educational Theory and Practice Research*, vol. 6, no. 3, pp. 352–358. https://doi.org/10.32709/akusosbil.466549. (in Turkish)

Çetin O. (2016). Pedagojik formasyon programı ile lisans eğitimi fen bilimleri öğretmen adaylarının sayısal okuryazarlık düzeylerinin incelenmesi [Examining the digital literacy levels of undergraduate science education and pedagogical formation programme preservice teachers]. *Erzincan Üniversitesi Eğitim Fakültesi Dergisi – Erzincan University Journal of Education Faculty*, vol. 18, no. 2, pp. 658–685. DOI: 10.17556/jef.01175. (in Turkish)

Clausing D., Holmes M. (2010). Technology readiness. *Research-Technology Management*, vol. 53, no. 4, pp. 52–59. https://doi.org/10.1080/08956308.2010.11657640.

Dabholkar P.A., Bagozzi R.P. (2002). An attitudinal model of technology-based self-service: Moderating effects of consumer traits and situational factors. *Journal of the Academy of Marketing Science*, vol. 30, no. 3, pp. 184–201. https://doi.org/10.1177/0092070302303001.

Davis F.D. (1985). A technology acceptance model for empirically testing new end-user ınformation systems: Theory and results. *Massachusetts Institute of Technology, PhD Dissertation, MIT Sloan School of Management*, Cambridge, MA. http://hdl.handle.net/1721.1/15192.

Davis F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of ınformation technology. *MIS Quarterly*, vol. 13, no. 3, pp. 319–340. https://doi.org/10.2307/249008.

Eshet-Alkalai Y. (2004). Digital literacy: A conceptual framework for survival skills in the digital era. *Journal of Educational Multimedia and Hypermedia*, vol. 13, no. 1, pp. 93–106.

Ferreira J.B., Rocha A.D., Silva J.F.D. (2014). Impacts of technology readiness on emotions and cognition in Brazil. *Journal of Business Research*, vol. 67, issue 5, pp. 865–873. https://doi.org/10.1016/j.jbusres.2013.07.005.

Geng S., Law K.M.Y., Niu B. (2019). Investigating self-directed learning and technology readiness in blending learning environment. *International Journal of Educational Technology in Higher Education,* vol. 16, no. 17. https://doi.org/10.1186/s41239-019-0147-0.

George D., Mallery M. (2010). *SPSS for Windows step by step: A simple guide and reference*. 17.0 update (10th ed.). Pearson.

Gilster P. (1997). *Digital literacy*. New York: John Wiley.

Godoe P., Johansen T.S. (2012). Understanding adoption of new technologies: Technology readiness and technology acceptance as an integrated concept. *Journal of European Psychology Students*, vol. 3, no. 1, pp. 38–52. DOI: http://doi.org/10.5334/jeps.aq.

Hair J., Black W., Babin B., Anderson R. (2014). *Multivariate data analysis*. (7th ed.). Pearson Education Limited.

Hamutoğlu N.B., Canan Güngören Ö., Kaya Uyanık G., Gür Erdoğan D. (2017). Dijital okuryazarlık ölçeği: Türkçe 'ye uyarlama çalışması [Adapting digital literacy scale into Turkish]. *Ege Eğitim Dergisi – Ege Journal of Education*, vol. 18, no. 1, pp. 408–429. DOI: 10.12984/egeefd.295306. (in Turkish)

Hanif A., Jamal F.Q., Imran M. (2018). Extending the technology acceptance model for use of elearning systems by digital learners. *IEEE Access*, vol. 6, pp. 73395–73404. https://doi.org/10.1109/ACCESS.2018.2881384.

Howland J.G., Wang Y.T. (2008). Synaptic plasticity in learning and memory: Stress effects in the hippocampus. *Progress in Brain Research*, vol. 169, pp. 145–158. DOI: 10.1016/S0079-6123(07)00008-8.

Kaeophanuek S., Na-Songkhla J., Nilsook P. (2018). How to enhance digital literacy skills among ınformation sciences students. *International Journal of Information and Education Technology*, vol. 8, no. 4, pp. 292–297. DOI: 10.18178/ijiet.2018.8.4.1050.

Koç Başaran Y. (2017). Sosyal bilimlerde örnekleme kuramı [Sampling theory in social sciences]. *Akademik Sosyal Araştırmalar Dergisi – The Journal of Academic Social Science*, vol. 5, no. 47, pp. 480–495. https://doi.org/10.16992/ASOS.12368. (in Turkish)

Kozan M., Özek B.M. (2019). BÖTE bölümü öğretmen adaylarının dijital okuryazarlık düzeyleri ve siber zorbalığa ilişkin duyarlılıklarının incelenmesi [Examination of department of CEIT teacher candidates' digital literacy levels and cyberbullying sensitivities]. *Fırat Üniversitesi Sosyal Bilimler Dergisi – Firat University Journal of Social Sciences*, vol. 29, no. 1, pp. 107–120. (in Turkish)

Kuek A., Hakkennes S. (2020). Healthcare staff digital literacy levels and their attitudes towards information systems. *Health Informatics Journal*, vol. 26, no. 1, pp. 592–612. https://doi.org/10.1177/1460458219839613.

Lam S.Y., Chiang J., Parasuraman A. (2008). The effects of the dimensions of technology readiness on technology acceptance: An empirical analysis. *Journal of Interactive Marketing,* vol. 22, no. 4, pp. 19–39. https://doi.org/10.1002/dir.20119.

Lasi H., Fettke P., Kemper H.G., Feld T., Hoffmann M. (2014). Industry 4.0. *Business & Information Systems Engineering*, vol. 6, no. 4, pp. 239–242. https://doi.org/10.1007/s12599-014-0334-4.

Liljander V., Gillberg F., Gummerus J., Reil A.V. (2006). Technology readiness and the evaluation and adoption of self-service technologies. *Journal of Retailing and Consumer Services*, vol. 13, no. 3, pp. 177–191. https://doi.org/10.1016/j.jretconser.2005.08.004.

Lin C.-H., Shih H.-Y., Sher P.J. (2007). Integrating technology readiness into technology acceptance: The TRAM model. *Psychology & Marketing*, vol. 24, no. 7, pp. 641–657. https://doi.org/10.1002/mar.20177.

Livingstone S., Van Couvering E., Thumim N. (2005). *Adult media literacy: A review of the research literature*. London: Ofcom.

Loyd B.H., Gressard C. (1984). Reliability and factorial validity of computer attitude scales. *Educational and Psychological Measurement,* vol. 44, no. 2, pp. 501–505. https://doi.org/10.1177/0013164484442033.

Lupien S.J., Wilkinson C.W., Briere S., Menard C., Kin N.M.K.N.Y., Nair N.P.V. (2002). The modulatory effects of corticosteroids on cognition: Studies in young human populations. *Psychoneuroendocrinology,* vol. 27, pp. 401–416. DOI: 10.1016/s0306-4530(01)00061-0.

Maiti D., Castellacci F., Melchior A. (2020). Digitalisation and development: Issues for India and beyond. In: D. Maiti, F. Castellacci, A. Melchior. (Eds.). *Digitalisation and development*. Springer, Singapore. https://doi.org/10.1007/978-981-13-9996-1_1.

Mancha R., Shankaranarayanan G. (2020). Making a digital innovator: Antecedents of innovativeness with digital technologies. *Information Technology and People*. DOI: 10.1108/ITP-12-2018-0577.

Marinho E.C., Silva M.F., Schmitz E., Alencar A.J. (2014). A Brazilian initiative towards digital literacy: Assessing motivational factors of e-Proinfo using TAM. *III Congresso Brasileiro de Informática na Educação (CBIE 2014)*. Pp. 1–10.

Markins J.C. (2009). Technology readiness assessments: A retrospective. *Acta Astronautica*, vol. 65, pp. 9–10, 1216–1223. https://doi.org/10.1016/j.actaastro.2009.03.058.

Meng J.G., Elliott K.M., Hall M.C. (2009). Technology readiness index (TRI): Assessing cross-cultural validity. *Journal of International Consumer Marketing*, vol. 22, no. 1, pp. 19–31. DOI: 10.1080/08961530902844915.

Meuter M.L., Bitner M.J., Ostrom A.L., Brown S.W. (2005). Choosing among alternative service delivery modes: An investigation of customer trial of self-service technologies. *Journal of Marketing, vol. 69, no.* 2, pp. 61–83. https://doi.org/10.1509/jmkg.69.2.61.60759.

Mohammadyari S., Singh H. (2015). Understanding the effect of e-learning on individual performance: The role of digital literacy. *Computer & Education*, vol. 82, pp. 11–25. https://doi.org/10.1016/j.compedu.2014.10.025.

Munger C.F., Loyd B.H. (1989). Gender and attitudes towards computers and calculators: The relationship to math performance. *Journal of Educational Computing Research*, vol. 5, issue 2, pp. 167–177. https://doi.org/10.2190/R1HL-LG9J-1YN5-AQ4N.

Ng W. (2012). Can we teach digital natives digital literacy? *Computers & Education*, vol. 59, no. 3, pp. 1065–1078. https://doi.org/10.1016/j.compedu.2012.04.016.

Nikou S., Brännback M., Widén G. (2019). The impact of digitalization on literacy: Digital immigrants vs. digital natives. In: *Proceedings of the 27th European Conference on Information Systems (ECIS)*, Stockholm & Uppsala, Sweden, June 8–14, 2019. https://aisel.aisnet.org/ecis2019_rp/39.

Ocak G., Karakuş G. (2019). Öğretmen adaylarının dijital okuryazarlık öz-yeterlilik becerilerinin farklı değişkenler açısından incelenmesi [An investigation of digital literacy self-efficacy skills of pre-service teachers in terms of different variables]. *Afyon Kocatepe Üniversitesi Sosyal Bilimler Dergisi – Afyon Kocatepe University Journal of Social Sciences,* vol. 21, no. 1, pp. 129–147. DOI: 10.32709/akusosbil.466549. (in Turkish)

Pakarinen E., Kiuru N., Lerkkanen M.K., Poikkeus A.M., Siekkinen M., Nurmi J.E. (2010). Classroom organization and teacher stress predict learning motivation in kindergarten children. *European Journal of Psychology of Education,* vol. 25, no. 3, pp. 281–300. https://doi.org/10.1007/s10212-010-0025-6.

Parasuraman A. (2000). Technology Readiness Index (TRI): A multiple-item scale to measure readiness to embrace new technologies. *Journal of Service Research*, vol. 2, issue 4, pp. 307–320. https://doi.org/10.1177/109467050024001.

Parasuraman A., Colby C.L. (2015). An updated and streamlined technology readiness index: TRI 2.0. *Journal of Service Research*, vol. 18, no. 1, pp. 59–74. https://doi.org/10.1177/1094670514539730.

Paul M., Upadhyay P., Dwivedi Y.K. (2020). Roadmap to digitalisation of an emerging economy: A viewpoint. *Transforming Government: People, Process and Policy*, vol. 14, no. 3, pp. 401–415. https://doi.org/10.1108/TG-03-2020-0054.

Rojas-Méndez J.I., Parasuraman A., Papadopoulos N. (2017). Demographics, attitudes, and technology readiness: A cross-cultural analysis and model validation. *Marketing Intelligence & Planning*, vol. 35, no. 1, pp. 18–39. https://doi.org/10.1108/MIP-08-2015-0163.

Rubino M., Vitolla F., Raimo N., Garcia-Sanchez I.M. (2020). Cross-country differences in European firms' digitalisation: The role of national culture. *Management Decision*, vol. 58, no. 8, pp. 1563–1583. https://doi.org/10.1108/MD-08-2019-1120.

Sadaf A., Gezer T. (2020). Exploring factors that influence teachers' intentions to integrate digital literacy using the decomposed theory of planned behavior. *Journal of Digital Learning in Teacher Education*, vol. 36, no. 2, pp. 124–145. DOI: 10.1080/21532974.2020.1719244.

Sadaf A., Johnson B.L. (2017). Teachers' beliefs about ıntegrating digital literacy ınto classroom practice: An investigation based on the theory of planned behavior. *Journal of Digital Learning in Teacher Education*, vol. 33, no. 4, pp. 129–137. DOI: 10.1080/21532974.2017.1347534.

Scheier M.F., Carver C.S. (1987). Dispositional optimism and physical well-being: The influence of generalized outcome expectancies on health. *Journal of Personality and Social Psychology*, vol. 55, issue 2, pp. 169–210. https://doi.org/10.1111/j.1467-6494.1987.tb00434.x.

Scherer R., Siddiq F., Tondeur J. (2019). The technology acceptance model (TAM): A meta-analytic structural equation modeling approach to explaining teachers' adoption of digital technology in education. *Computers & Education*, vol. 128, pp. 13–35. https://doi.org/10.1016/j.compedu.2018.09.009.

Selvi Ö.Ö. (2012). Bilgi toplumu, bilgi yönetimi ve halkla ilişkiler [Information society, information management and public relations]. *Gümüşhane Üniversitesi İletişim Fakültesi Elektronik Dergisi – Gümüşhane University e-Journal of Faculty of Communication*, vol. 1, no. 3, pp. 191–214. (in Turkish)

Shors T.J. (2006). Stressful experience and learning across the lifespan. *Annual Review of Psychology*, vol. 57, pp. 55–85. DOI: 10.1146/annurev.psych.57.102904.190205.

Tabachnick B.G., Fidell L.S. (2013). *Using multivariate statistics* (6th ed.). Pearson.

Taylor S., Todd P.A. (1995). Understanding information technology usage: A test of competing models. *Information Systems Research*, vol. 6, no. 2, pp. 144–176. DOI: 10.1287/isre.6.2.144.

Üstündağ M., Güneş E., Bahçivan E. (2017). Turkish adaptation of digital literacy scale and ınvestigating pre-service science teachers' digital literacy. *Journal of Education and Future*, issue 12, pp. 19–29.

Venkatesh V., Morris M.G., Davis G.B., Davis F.D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, vol. 27, no. 3, pp. 425–478. https://doi.org/10.2307/30036540.

Venkatesh V., Thong J.Y.L., Xu X. (2016). Unified theory of acceptance and use of technology: A synthesis and the road ahead. *Journal of the Association for Information Systems,* vol. 17, no. 5, pp. 328–376. DOI: 10.17705/1jais.00428.

Источники

Ajzen I., Fishbein M. (1975). *Belief, attitude, intention and behavior: An introduction to theory research*. Reading, MA: Addison-Wesley.

Ajzen I., Fishbein M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.

Ajzen I., Madden T.J. (1986). Prediction of goal-directed behavior: Attitudes, intentions, and perceived behavioral control. *Journal of Experimental Social Psychology*, vol. 22, no. 5, pp. 453–474. https://doi.org/10.1016/0022-1031(86)90045-4.

Alt D., Raichel N. (2020). Enhancing perceived digital literacy skills and creative self-concept through gamified learning environments: Insights from a longitudinal study. *International Journal of Educational Research,* vol. 101, 101561. https://doi.org/10.1016/j.ijer.2020.101561.

Arklan Ü., Taşdemir E. (2008). Bilgi toplumu ve iletişim: bilginin yayılması sürecinde kitle iletişim araçları ve internet [The information society and communicatıon: mass media and internet at the diffusion process of information]. *Selçuk İletişim*, vol. 5, no. 3, pp. 67–80. (in Turkish)

Aviram A., Eshet-Alkalai Y. (2006). Towards a theory of digital literacy: Three scenarios for the next steps. http://www.eurodl.org/materials/contrib/2006/Aharon_Aviram.html.

Bandura A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, vol. 37, no. 2, pp. 122–147. DOI: 10.1037/0003-066X.37.2.122.

Bejaković P., Mrnjavac Ž. (2020). The importance of digital literacy on the labour market. *Employee Relations*, vol. 42, no. 4, pp. 921–932. https://doi.org/10.1108/ER-07-2019-0274.

Blut M., Wang C. (2019). Technology readiness: A meta-analysis of conceptualizations of the construct and its impact on technology usage. *Journal of the Academy of Marketing Science*, vol. 48, pp. 649–669. https://doi.org/10.1007/s11747-019-00680-8.

Bruce C.S. (1999). Workplace experiences of information literacy. *International Journal of Information Management,* vol. 19, no. 1, pp. 33–47. https://doi.org/10.1016/S0268-4012(98)00045-0.

Buchanan T., Sainter P., Saubders G. (2013). Factors affecting faculty use of learning technologies: Implications for models of technology adoption. *Journal of Computing in Higher Education*, vol. 25, pp. 1–11. https://doi.org/10.1007/s12528-013-9066-6.

Çağlıyan V., Doğanalp B. (2020). Dijital okuryazarlık internet girişimciliği niyeti ilişkisi üzerine ampirik bir çalışma [An empirical study on the relationship between digital literacy and internet entrepreneurship intention]. *Pamukkale Üniversitesi İşletme Araştırmaları Dergisi – Pamukkale University Journal of Business Studies*, vol. 7, no. 2, pp. 180–199. DOI: 10.47097/piar.807027. (in Turkish)

Cahill L., Gorski L., Le K. (2003). Enhanced human memory consolidation with post-learning stress: Interaction with the degree of arousal at encoding. *Learning Memory*, vol. 10, pp. 270–274. https://doi.org/10.1101/lm.62403.

Çam E., Kıyıcı M. (2017). Perceptions of prospective teachers on digital literacy. *Malaysian Online Journal of Educational Technology*, vol. 5, no. 4, pp. 29–44.

Can Ş., Çelik B., Çelik C. (2020). Fen bilgisi öğretmen adaylarının dijital okuryazarlık düzeyine çeşitli değişkenlerin etkisi [The effect of various variables on the digital literacy level of science teacher candidates]. *Eğitim Kuram ve Uygulama Araştırmaları Dergisi – Journal of Educational Theory and Practice Research*, vol. 6, no. 3, pp. 352–358. https://doi.org/10.32709/akusosbil.466549. (in Turkish)

Çetin O. (2016). Pedagojik formasyon programı ile lisans eğitimi fen bilimleri öğretmen adaylarının sayısal okuryazarlık düzeylerinin incelenmesi [Examining the digital literacy levels of undergraduate science education and pedagogical formation programme preservice teachers]. *Erzincan Üniversitesi Eğitim Fakültesi Dergisi – Erzincan University Journal of Education Faculty*, vol. 18, no. 2, pp. 658–685. DOI: 10.17556/jef.01175. (in Turkish)

Clausing D., Holmes M. (2010). Technology readiness. *Research-Technology Management*, vol. 53, no. 4, pp. 52–59. https://doi.org/10.1080/08956308.2010.11657640.

Dabholkar P.A., Bagozzi R.P. (2002). An attitudinal model of technology-based self-service: Moderating effects of consumer traits and situational factors. *Journal of the Academy of Marketing Science*, vol. 30, no. 3, pp. 184–201. https://doi.org/10.1177/0092070302303001.

Davis F.D. (1985). A technology acceptance model for empirically testing new end-user ınformation systems: Theory and results. *Massachusetts Institute of Technology, PhD Dissertation, MIT Sloan School of Management*, Cambridge, MA. http://hdl.handle.net/1721.1/15192.

Davis F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of ınformation technology. *MIS Quarterly*, vol. 13, no. 3, pp. 319–340. https://doi.org/10.2307/249008.

Eshet-Alkalai Y. (2004). Digital literacy: A conceptual framework for survival skills in the digital era. *Journal of Educational Multimedia and Hypermedia*, vol. 13, no. 1, pp. 93–106.

Ferreira J.B., Rocha A.D., Silva J.F.D. (2014). Impacts of technology readiness on emotions and cognition in Brazil. *Journal of Business Research*, vol. 67, issue 5, pp. 865–873. https://doi.org/10.1016/j.jbusres.2013.07.005.

Geng S., Law K.M.Y., Niu B. (2019). Investigating self-directed learning and technology readiness in blending learning environment. *International Journal of Educational Technology in Higher Education,* vol. 16, no. 17. https://doi.org/10.1186/s41239-019-0147-0.

George D., Mallery M. (2010). *SPSS for Windows step by step: A simple guide and reference*. 17.0 update (10th ed.). Pearson.

Gilster P. (1997). *Digital literacy*. New York: John Wiley.

Godoe P., Johansen T.S. (2012). Understanding adoption of new technologies: Technology readiness and technology acceptance as an integrated concept. *Journal of European Psychology Students*, vol. 3, no. 1, pp. 38–52. DOI: http://doi.org/10.5334/jeps.aq.

Hair J., Black W., Babin B., Anderson R. (2014). *Multivariate data analysis*. (7th ed.). Pearson Education Limited.

Hamutoğlu N.B., Canan Güngören Ö., Kaya Uyanık G., Gür Erdoğan D. (2017). Dijital okuryazarlık ölçeği: Türkçe 'ye uyarlama çalışması [Adapting digital literacy scale into Turkish]. *Ege Eğitim Dergisi – Ege Journal of Education*, vol. 18, no. 1, pp. 408–429. DOI: 10.12984/egeefd.295306. (in Turkish)

Hanif A., Jamal F.Q., Imran M. (2018). Extending the technology acceptance model for use of elearning systems by digital learners. *IEEE Access*, vol. 6, pp. 73395–73404. https://doi.org/10.1109/ACCESS.2018.2881384.

Howland J.G., Wang Y.T. (2008). Synaptic plasticity in learning and memory: Stress effects in the hippocampus. *Progress in Brain Research*, vol. 169, pp. 145–158. DOI: 10.1016/S0079-6123(07)00008-8.

Kaeophanuek S., Na-Songkhla J., Nilsook P. (2018). How to enhance digital literacy skills among ınformation sciences students. *International Journal of Information and Education Technology*, vol. 8, no. 4, pp. 292–297. DOI: 10.18178/ijiet.2018.8.4.1050.

Koç Başaran Y. (2017). Sosyal bilimlerde örnekleme kuramı [Sampling theory in social sciences]. *Akademik Sosyal Araştırmalar Dergisi – The Journal of Academic Social Science*, vol. 5, no. 47, pp. 480–495. https://doi.org/10.16992/ASOS.12368. (in Turkish)

Kozan M., Özek B.M. (2019). BÖTE bölümü öğretmen adaylarının dijital okuryazarlık düzeyleri ve siber zorbalığa ilişkin duyarlılıklarının incelenmesi [Examination of department of CEIT teacher candidates' digital literacy levels and cyberbullying sensitivities]. *Fırat Üniversitesi Sosyal Bilimler Dergisi – Firat University Journal of Social Sciences*, vol. 29, no. 1, pp. 107–120. (in Turkish)

Kuek A., Hakkennes S. (2020). Healthcare staff digital literacy levels and their attitudes towards information systems. *Health Informatics Journal*, vol. 26, no. 1, pp. 592–612. https://doi.org/10.1177/1460458219839613.

Lam S.Y., Chiang J., Parasuraman A. (2008). The effects of the dimensions of technology readiness on technology acceptance: An empirical analysis. *Journal of Interactive Marketing,* vol. 22, no. 4, pp. 19–39. https://doi.org/10.1002/dir.20119.

Lasi H., Fettke P., Kemper H.G., Feld T., Hoffmann M. (2014). Industry 4.0. *Business & Information Systems Engineering*, vol. 6, no. 4, pp. 239–242. https://doi.org/10.1007/s12599-014-0334-4.

Liljander V., Gillberg F., Gummerus J., Reil A.V. (2006). Technology readiness and the evaluation and adoption of self-service technologies. *Journal of Retailing and Consumer Services*, vol. 13, no. 3, pp. 177–191. https://doi.org/10.1016/j.jretconser.2005.08.004.

Lin C.-H., Shih H.-Y., Sher P.J. (2007). Integrating technology readiness into technology acceptance: The TRAM model. *Psychology & Marketing*, vol. 24, no. 7, pp. 641–657. https://doi.org/10.1002/mar.20177.

Livingstone S., Van Couvering E., Thumim N. (2005). *Adult media literacy: A review of the research literature*. London: Ofcom.

Loyd B.H., Gressard C. (1984). Reliability and factorial validity of computer attitude scales. *Educational and Psychological Measurement,* vol. 44, no. 2, pp. 501–505. https://doi.org/10.1177/0013164484442033.

Lupien S.J., Wilkinson C.W., Briere S., Menard C., Kin N.M.K.N.Y., Nair N.P.V. (2002). The modulatory effects of corticosteroids on cognition: Studies in young human populations. *Psychoneuroendocrinology,* vol. 27, pp. 401–416. DOI: 10.1016/s0306-4530(01)00061-0.

Maiti D., Castellacci F., Melchior A. (2020). Digitalisation and development: Issues for India and beyond. In: D. Maiti, F. Castellacci, A. Melchior. (Eds.). *Digitalisation and development*. Springer, Singapore. https://doi.org/10.1007/978-981-13-9996-1_1.

Mancha R., Shankaranarayanan G. (2020). Making a digital innovator: Antecedents of innovativeness with digital technologies. *Information Technology and People*. DOI: 10.1108/ITP-12-2018-0577.

Marinho E.C., Silva M.F., Schmitz E., Alencar A.J. (2014). A Brazilian initiative towards digital literacy: Assessing motivational factors of e-Proinfo using TAM. *III Congresso Brasileiro de Informática na Educação (CBIE 2014)*. Pp. 1–10.

Markins J.C. (2009). Technology readiness assessments: A retrospective. *Acta Astronautica*, vol. 65, pp. 9–10, 1216–1223. https://doi.org/10.1016/j.actaastro.2009.03.058.

Meng J.G., Elliott K.M., Hall M.C. (2009). Technology readiness index (TRI): Assessing cross-cultural validity. *Journal of International Consumer Marketing*, vol. 22, no. 1, pp. 19–31. DOI: 10.1080/08961530902844915.

Meuter M.L., Bitner M.J., Ostrom A.L., Brown S.W. (2005). Choosing among alternative service delivery modes: An investigation of customer trial of self-service technologies. *Journal of Marketing, vol. 69, no.* 2, pp. 61–83. https://doi.org/10.1509/jmkg.69.2.61.60759.

Mohammadyari S., Singh H. (2015). Understanding the effect of e-learning on individual performance: The role of digital literacy. *Computer & Education*, vol. 82, pp. 11–25. https://doi.org/10.1016/j.compedu.2014.10.025.

Munger C.F., Loyd B.H. (1989). Gender and attitudes towards computers and calculators: The relationship to math performance. *Journal of Educational Computing Research*, vol. 5, issue 2, pp. 167–177. https://doi.org/10.2190/R1HL-LG9J-1YN5-AQ4N.

Ng W. (2012). Can we teach digital natives digital literacy? *Computers & Education*, vol. 59, no. 3, pp. 1065–1078. https://doi.org/10.1016/j.compedu.2012.04.016.

Nikou S., Brännback M., Widén G. (2019). The impact of digitalization on literacy: Digital immigrants vs. digital natives. In: *Proceedings of the 27th European Conference on Information Systems (ECIS)*, Stockholm & Uppsala, Sweden, June 8–14, 2019. https://aisel.aisnet.org/ecis2019_rp/39.

Ocak G., Karakuş G. (2019). Öğretmen adaylarının dijital okuryazarlık öz-yeterlilik becerilerinin farklı değişkenler açısından incelenmesi [An investigation of digital literacy self-efficacy skills of pre-service teachers in terms of different variables]. *Afyon Kocatepe Üniversitesi Sosyal Bilimler Dergisi – Afyon Kocatepe University Journal of Social Sciences,* vol. 21, no. 1, pp. 129–147. DOI: 10.32709/akusosbil.466549. (in Turkish)

Pakarinen E., Kiuru N., Lerkkanen M.K., Poikkeus A.M., Siekkinen M., Nurmi J.E. (2010). Classroom organization and teacher stress predict learning motivation in kindergarten children. *European Journal of Psychology of Education,* vol. 25, no. 3, pp. 281–300. https://doi.org/10.1007/s10212-010-0025-6.

Parasuraman A. (2000). Technology Readiness Index (TRI): A multiple-item scale to measure readiness to embrace new technologies. *Journal of Service Research*, vol. 2, issue 4, pp. 307–320. https://doi.org/10.1177/109467050024001.

Parasuraman A., Colby C.L. (2015). An updated and streamlined technology readiness index: TRI 2.0. *Journal of Service Research*, vol. 18, no. 1, pp. 59–74. https://doi.org/10.1177/1094670514539730.

Paul M., Upadhyay P., Dwivedi Y.K. (2020). Roadmap to digitalisation of an emerging economy: A viewpoint. *Transforming Government: People, Process and Policy*, vol. 14, no. 3, pp. 401–415. https://doi.org/10.1108/TG-03-2020-0054.

Rojas-Méndez J.I., Parasuraman A., Papadopoulos N. (2017). Demographics, attitudes, and technology readiness: A cross-cultural analysis and model validation. *Marketing Intelligence & Planning*, vol. 35, no. 1, pp. 18–39. https://doi.org/10.1108/MIP-08-2015-0163.

Rubino M., Vitolla F., Raimo N., Garcia-Sanchez I.M. (2020). Cross-country differences in European firms' digitalisation: The role of national culture. *Management Decision*, vol. 58, no. 8, pp. 1563–1583. https://doi.org/10.1108/MD-08-2019-1120.

Sadaf A., Gezer T. (2020). Exploring factors that influence teachers' intentions to integrate digital literacy using the decomposed theory of planned behavior. *Journal of Digital Learning in Teacher Education*, vol. 36, no. 2, pp. 124–145. DOI: 10.1080/21532974.2020.1719244.

Sadaf A., Johnson B.L. (2017). Teachers' beliefs about ıntegrating digital literacy ınto classroom practice: An investigation based on the theory of planned behavior. *Journal of Digital Learning in Teacher Education*, vol. 33, no. 4, pp. 129–137. DOI: 10.1080/21532974.2017.1347534.

Scheier M.F., Carver C.S. (1987). Dispositional optimism and physical well-being: The influence of generalized outcome expectancies on health. *Journal of Personality and Social Psychology*, vol. 55, issue 2, pp. 169–210. https://doi.org/10.1111/j.1467-6494.1987.tb00434.x.

Scherer R., Siddiq F., Tondeur J. (2019). The technology acceptance model (TAM): A meta-analytic structural equation modeling approach to explaining teachers' adoption of digital technology in education. *Computers & Education*, vol. 128, pp. 13–35. https://doi.org/10.1016/j.compedu.2018.09.009.

Selvi Ö.Ö. (2012). Bilgi toplumu, bilgi yönetimi ve halkla ilişkiler [Information society, information management and public relations]. *Gümüşhane Üniversitesi İletişim Fakültesi Elektronik Dergisi – Gümüşhane University e-Journal of Faculty of Communication*, vol. 1, no. 3, pp. 191–214. (in Turkish)

Shors T.J. (2006). Stressful experience and learning across the lifespan. *Annual Review of Psychology*, vol. 57, pp. 55–85. DOI: 10.1146/annurev.psych.57.102904.190205.

Tabachnick B.G., Fidell L.S. (2013). *Using multivariate statistics* (6th ed.). Pearson.

Taylor S., Todd P.A. (1995). Understanding information technology usage: A test of competing models. *Information Systems Research*, vol. 6, no. 2, pp. 144–176. DOI: 10.1287/isre.6.2.144.

Üstündağ M., Güneş E., Bahçivan E. (2017). Turkish adaptation of digital literacy scale and ınvestigating pre-service science teachers' digital literacy. *Journal of Education and Future*, issue 12, pp. 19–29.

Venkatesh V., Morris M.G., Davis G.B., Davis F.D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, vol. 27, no. 3, pp. 425–478. https://doi.org/10.2307/30036540.

Venkatesh V., Thong J.Y.L., Xu X. (2016). Unified theory of acceptance and use of technology: A synthesis and the road ahead. *Journal of the Association for Information Systems,* vol. 17, no. 5, pp. 328–376. DOI: 10.17705/1jais.00428.

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