VALIDITY AND RELIABILITY STUDY OF THE DIGITAL WELL-BEING SCALE

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ABSTRACT
The state of well-being in using technology plays an essential role in society's general health, especially for individuals. For this reason, it is crucial to investigate the well-being of those who do professions that require the use of technology to be more successful in their career. Digital well-being reveals the satisfaction arising from people's use of technology or the difficulties arising from digital platforms. The rapid change of digital, like the rapid change of other technologies, affects people's lives positively or negatively. For example, the rapid shift in digitalization has reached an alarming level regarding its use in young people. Having a good time when young people use digital communication tools, namely social networks such as Facebook, Twitter, and YouTube, makes them feel better on social networking platforms. The concept of digital well-being explains that young people often feel more positive when they use digital communication tools. This study examined the effects of digital well-being on people, and the digital well-being scale was developed. Based on this idea, in this research, the social, environmental and mental states of digital technology use were examined for university students, where technology is essential in their profession. Within the scope of this study, the 'Digital Well-being Scale' was developed. The validity and reliability analyses of the scale were performed. Exploratory and confirmatory factor analyses were used in the validity analysis. As a result of the studies, the digital well-being of the participants was evaluated according to the variables such as gender and age with the remaining items. According to the study's validity and reliability analysis results, the digital well-being scale rated in 4-dimensional and 5-point Likert type with 12 items is valid and reliable. When the results were evaluated as a whole, it was revealed that the model was suitable for the data set as the original four-factor model proposed for the scale.
Keywords: Digital Tools, Internet, Digital Well-being

In this study, I. The Validity and Reliability Study of the Digital Well-being Scale was presented at the International Positive Well-being Congress on May 16-17, 2023. In addition, the scale was developed in the doctoral thesis titled 'Evaluation of Digital Well-being of University students

Introduction

In recent years, the rapid progress of technology and the entry of individuals into every aspect of their lives have brought many changes in their lives. The use of technology, which contributes to the development of society, is seen as a communication tool that makes life easier.

On the one hand, technology facilitates the tasks we need to do in daily life; on the other hand, some health problems arise because it causes people to remain inactive. For example, from constantly staying at the computer, various November muscle diseases, neck pains, cervical hernia, and weight gain (obesity), etc., problems are emerging. In addition, various psychological problems arise from excessive use of the Internet. For example, inability to do without the Internet, feeling psychologically harmful when left without the Internet, constant desire to be online on social media, failure to stop using the Internet, internet addiction, depression, damage to social relationships, isolation, etc., problems are emerging. Despite these harms, it has become an indispensable element of our lives due to the convenience that technology has brought to our lives. In addition, technology has undergone rapid change in the last thirty years and continues to do so. One of these changing technologies manifests itself as digitalization.

The rapid change of digital, like the rapid change of other technologies, affects people's lives positively or negatively. For example, the rapid shift in digitalization has reached an alarming level regarding its use in young people. Having a good time when young people use digital communication tools, namely social networks such as Facebook, Twitter, and YouTube, makes them feel better on social networking platforms. The concept of digital well-being explains that young people often feel more positive when they use digital communication tools.

Subjective well-being is about happiness, avoiding sadness, experiencing positive and negative emotions, and creating a good feeling about achieving satisfaction (Hamurcu, 2011). The concept of well-being has been associated with many positive happiness-related behaviours. This favourable structure is now emerging as qualities that positively affect many different parts of life, such as better or three solid friendship relationships

and a healthier body to succeed in school business life (Diener & Chan, 2011). This situation can be explained by the concept of digital well-being in people who have high positive emotions, i.e. well-being, by using digital tools. While the fact that individuals who cannot speak in public and have crowd phobia can express themselves more comfortably and confidently in the virtual world can be explained by digital well-being, moving away from healthy face-to-face communication and isolating themselves from the real world negatively affects digital well-being. Digital well-being is the physical well-being of individuals due to the use of technological tools, social networks, the Internet, mobile devices and applications, and it is a state of being happy in social and spiritual dimensions. The high level of likes of the shares made by individuals on social media platforms also increases digital well-being. Again, individuals' efforts and efforts for the sake of the composition or beauty of the shares they will make on social media platforms can also be shown as an example of digital well-being.

The use of digital devices, tools and applications can increase the well-being of individuals and also cause them to fall. Individuals access information online, receive education, receive compliments and socialize, can communicate anywhere in the world and their digital well-being increases while pleasantly playing digital games. In addition, when individuals are exposed to cyberbullying, stay at the computer for a long time, disrupt sleep patterns, encounter online shopping scams, hack their accounts, and develop an addiction to the Internet and games, the digital well-being of individuals decreases.

The state of well-being in using technology plays an essential role in society's general health, especially for individuals. For this reason, it is crucial to investigate the well-being of those who do professions that require the use of technology to be more successful in their career. Based on this idea, this research examines the social, environmental and mental states of technology use for university students, where it is essential to their profession.

Method

Research Design This research is based on a quantitative method. It is based on the screening model quantitatively. In this part of the research, a screening model was used to reveal the Evaluation of the digital well-being of university students. The Screening Model is a research approach that does not describe a situation that existed in the past or at that moment as it exists but aims to define it. The screening model is a research pattern used to collect data about the ideas, attitudes, and behaviours of individuals in large groups about a topic and to reveal the group's structure related to the topic (Huck, 2012).

The study group is students of the faculty of education of a private university. Since this study is a scale development research, data were collected as two separate groups from students studying in the sample group in the departments determined according to the objective method to apply exploratory and confirmatory factor analyses (EFA and DFA) for testing purposes.

The purpose of scale development is to structure the items in terms of subject (Erkuş, 2014). For this reason, during the preparation process of the scale prepared within the scope of the Evaluation of the digital well-being of university students, a pool of items was created by first scanning the literature.This study was produced from my doctoral thesis "Evaluation of digital well-being of university students".

Creation of a Material Pool

The item pool was obtained using the literature during the development stage of the scale. There are a total of 400 items in the item pool. After the expert opinions were taken for the research scale, 30 articles remained. A personal information form containing the participants' demographic information was also added to the scale to be applied according to the expert feedback. Age, gender, department, purpose of social media use, internet access device, which connection provides access to the Internet, how many hours a day does he use social media, for what purpose does he use the Internet, a personal information form containing membership status questions were used in the survey. With its final form, the scale and the unique information form were distributed to university students for application.

Obtaining Expert Opinions For Scope And Appearance Validity

The indicator of whether the substances are sufficient in quantity and quality to measure the desired behaviour (property) is scope validity (Büyüköztürk, 2018). To determine the adequacy and coverage suitability of the items included in the item pool for measurement within the scope of the Evaluation of the digital well-being of university students, an expert opinion was obtained from 5 field experts using the form containing the items. When creating the item opinion form, first of all, a directive reflecting the explanations related to the scope of the scale and what is expected from the experts was presented. Expert opinions on whether the substances are suitable for coverage were obtained using the 5-li Likert rating scale. When deciding on the suitability of the

importance of range, the average score of each substance was calculated and compared with the actual upper limit of the moderately suitable option, 2.5 points (Kılıç Çakmak, Güneş, Çiftci and Üstündağ, 2011). According to Erkuş (2014), the items that experts agree on in examining manners and statistical things remain; some are reviewed, and some are discarded. Accordingly, five items with an average score of less than 2.5 were removed, two were edited, and 30 were obtained. The items were randomly sorted on the data collection tool. Turkish language appropriateness All the articles written were examined by a Turkish Teaching faculty member who has a PhD degree in their field and is employed at the faculty of education to evaluate Turkish language appropriateness. A directive has been prepared for the draft scale reflecting the participants' explanations of the purpose and what is expected. Expressions of mindfulness were scaled with a five-point Likert rating. Likert-type ratings are in the form of "I Agree (5)", "I agree (4)", "I am undecided (3)", "I Disagree (2)", and "I Disagree (1)". For articles containing all positive statements, the "I Agree" rating is 5 points, and the equivalent of the "I Disagree" rating is 1 point. As the total score obtained from the scale increases, the evaluation scores of the digital well-being of university students also increase.

Finally, the draft scale, prepared for the preliminary experiment, was evaluated by three faculty members with doctoral degrees experienced in scale development. In this process, by expert opinions, the items were assessed in terms of whether there is an expression of awareness, how things are expressed, their suitability for the study and the validity of the scope.

Implementation of the Preliminary Trial Application

February and April 2019 implementation took place between February and April 2019. Dec. Validity and reliability analyses of the scale were carried out with the data obtained from the participants. Exploratory and confirmatory factor analysis will be used in the validity analysis. Cronbach alpha and item test correlations were calculated for reliability. As a result of the studies, the digital well-being of the participants was evaluated according to the variables such as gender and age with the remaining items. In the trial application during the scale development process, the sample should represent only the scope of the measured characteristic, be heterogeneous, and consist of voluntary participants (Erkuş, 2014). Accordingly, the application was made based on volunteering to private university students with the draft scale, which was prepared for the preliminary experiment. Karasar (2012) states that the number of participants should not exceed 50 for the initial trial to be conducted at the stage of developing a scale. The scale development studies also state that the sample size should be at least five times the size of the number of items to be subjected to factor analysis, provided that it is not less than 100 people (Tavşancıl, 2002). the ethics committee of the private university has obtained the necessary permissions to implement the 30-item draft scale. The researcher reproduced the draft scale, and the application was started by multiplying 500 pieces. The average response time of the scale was determined as 15 minutes. At the end of the application, 40 incomplete completed questionnaires were not considered, and the questionnaire returned from 460 participants was assessed.

Data analysis

The study used SPSS 23 and AMOS 22 package programs to analyze the collected data. The study applied analysis techniques such as EFA, DFA, mean, standard deviation, frequency, percentage, t-test, and ANOVA to the data.

Findings Related to the Validity of the Scale

When the literature is examined, construct validity in scale development is carried out using exploratory and confirmatory factor analyses (EFA and CFA). Different application versions of AFA and DFA applications exist in the scale development process (Doğan et al., 2017). In other words, there are AFA and DFA studies on different data, just as there is the application of AFA and DFA on the same data. Which of them is correct is a controversial topic in the literature. In this study, AFA was applied to the data obtained from the first sample group, and DFA was applied to the data obtained from the second sample group.

Exploratory Factor Analysis

It is emphasized that the minimum number of samples should be N=100 and N=200 from the AFA studies, one of the most commonly used statistical analysis methods in research in social sciences (Karaman, 2015). In this study, the number of samples for AFA was determined as 250. Before the AFA, Kaiser Meyer-Olkin (KMO) and Bartlett's test significance values were examined to determine the appropriateness of the data and the value results are presented in Table 1.

Table 1. KMO and Bartlett's Testi Result

		Value
KMO		.826
Bartlett's Test	Ki-Spuares	2885.091
	Sd.	435
	P	.000

Table 1. When examined, the fact that the KMO value is above 0.70 and the Barlett test is significant shows that the data are suitable for factor analysis.

In the factor analysis conducted for the scale, the eigenvalue was initially determined as 1 and 5 components were identified (Table 2). The total variance explained by five factors is 51.179% (Büyüköztürk et al., 2017). It was decided that the scale should be five-factor.

Tablo 2. Factor Analysis of the Scale

compone nt	Initial Self-worth			Predicate of Squares			The sum of Rotation Squares		
	Tota l	Variance %	cumulativ e %	Topla m	Variance %	cumulativ e %	Tota l	Variance %	cumulativ e %
1	7.12	23.74	23.74	7.12	23.74	23.74	4.28	14.26	14.26
2	2.96	9.88	33.61	2.96	9.88	33.61	4.28	14.25	28.52
3	2.10	7.01	40.62	2.10	7.01	40.62	2.41	8.04	36.56
4	1.72	5.75	46.37	1.72	5.75	46.37	2.37	7.90	44.47
5	1.44	4.81	51.18	1.44	4.81	51.18	2.01	6.71	51.18
6	.89	2.98	69.07						
7	.83	2.77	71.83						
….									

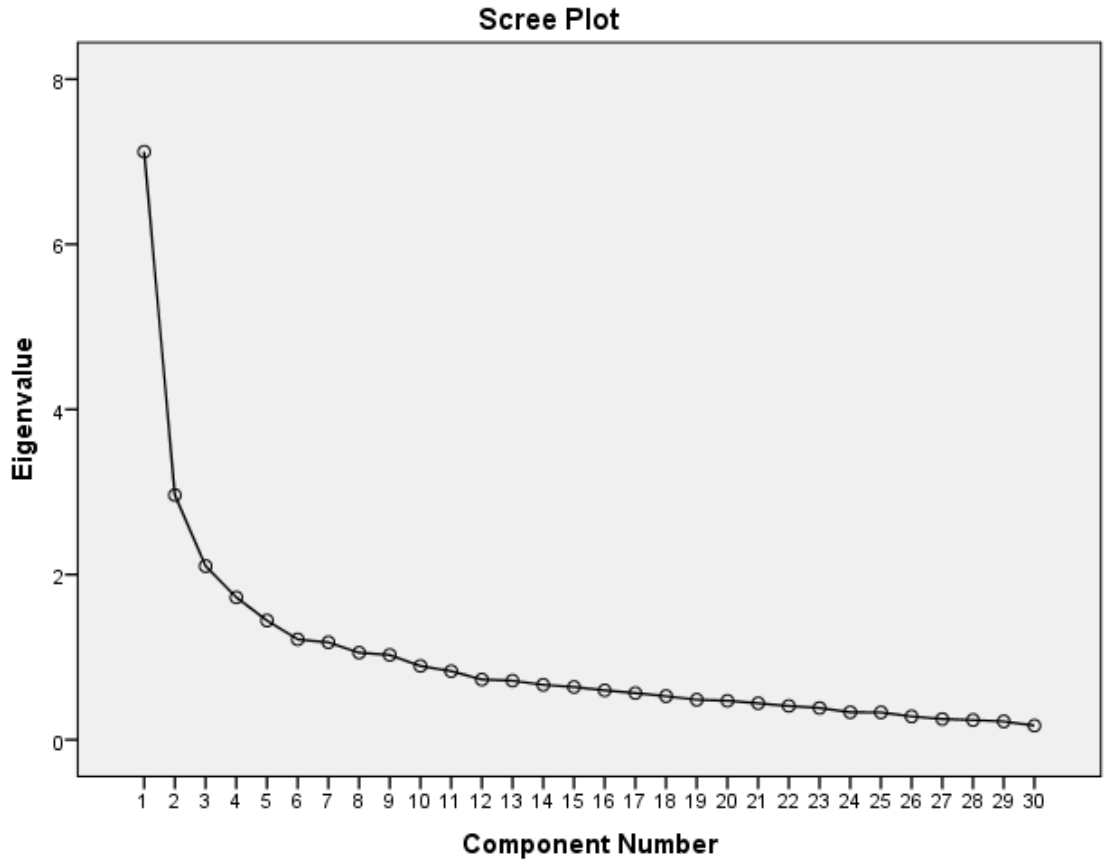


Figure 1. Slope-Deposit Graph

As can be seen from the slope-deposit graph in Figure 1, 5 points were considered as the cut-off point for the number of factors, and based on these results, it was decided that the scale should be five-dimensional.

A good measure of factor load value of 0.45 or higher for selection (Büyüköztürk et al., 2017), by determining the factor load value as 0.45 and above, it was seen that 50 items remained below this value. Starting from the item with the most negligible factor load value, these items were discarded, and the factor analysis was repeated for each item. After 50 items were removed, the item factor loads of the remaining things of the scale, whose structural validity was provided, are shown in Table 3. When Table 3 is examined, the item factor load values of the items included in the first dimension are .819-.702; the item factor load values of the substances contained in the second dimension are .699-.501; item factor load values of importance in the third dimension, .800-.507; item factor load values of items in the fourth dimension.630-.480; article factor load values of substances in the fifth dimension .687-.it ranges from 555 Dec.

Table 3. Factor Load Values of Substances According to Rotation Analysis

ingredients	Components					Reliability	
	1	2	3	4	5	Item Correlation	Test Cronbach Alpha
M1	.819					.651	.900
M2	.813					.751	
M3	.806					.767	
M4	.796					.755	
M5	.765					.746	
M6	.702					.705	
M7		.699				.633	.845
M8		.694				.594	
M9		.686				.598	
M10		.674				.585	
M11		.650				.589	
M12		.595				.497	
M13		.591				.478	
M14		.571				.528	
M15		.502				.464	
M16		.501				.452	
M17			.800			.634	.742
M18			.720			.559	
M19			.669			.529	
M20			.507			.429	
M21				.630		.460	.650
M22				.610		.464	
M23				.601		.374	
M24				.551		.369	
M25				.495		.299	
M26				.480		.309	
M27					.687	.421	.618

M28	.673	.387
M29	.603	.431
M30	.555	.360

In addition, Cronbach alpha and item test correlation values were examined for the reliability and item discrimination of the sub-dimensions of the scale and the results are shown in Table 4.3 above. The Cronbach alpha values of the sub-dimensions of the scale.900 -.it is seen that it has changed from 618 Dec. It can be said that the matters related to the resulting sub-dimensions are reliable (Büyüköztürk, 2018). When item test correlation values are examined, item values in the first dimension, .767 - .651; item values in the second dimension, .633 - .452; item values in the third dimension, .634 - .429; the importance of the matter in the fourth dimension, .460 - .299; values of weight in the fifth dimension, .431 - .it ranges from 360 Dec. After the calculated item test correlation coefficient; any item was discarded because its value was above 0.250.

Confirmatory Factor Analysis

After using exploratory factor analysis in the scale development, confirmatory factor analysis (CFA) was used to confirm the structure of the developed scale. The DFA was conducted on the data set created by 210 responders. After it was seen that the dataset did not contain any lost value, it was examined in terms of one-way and multi-way end values before DFA. The Z score was ± 3.3 (p < .There is no data in the data set outside the 001) December. According to the multivariate end value analysis, when p < 0.001 was taken into account, 53 data were extracted from the data set. As a result of the studies related to the assumptions, DFA analysis was performed on 157 data. The DFA has been repeated several times to provide the model fit index. As a result of the CFA analyses, 18 items, including one dimension, were excluded from the analysis. The model-suitable index was provided with 12 4-dimensional objects, and the model-appropriate index is shown in Table 4.

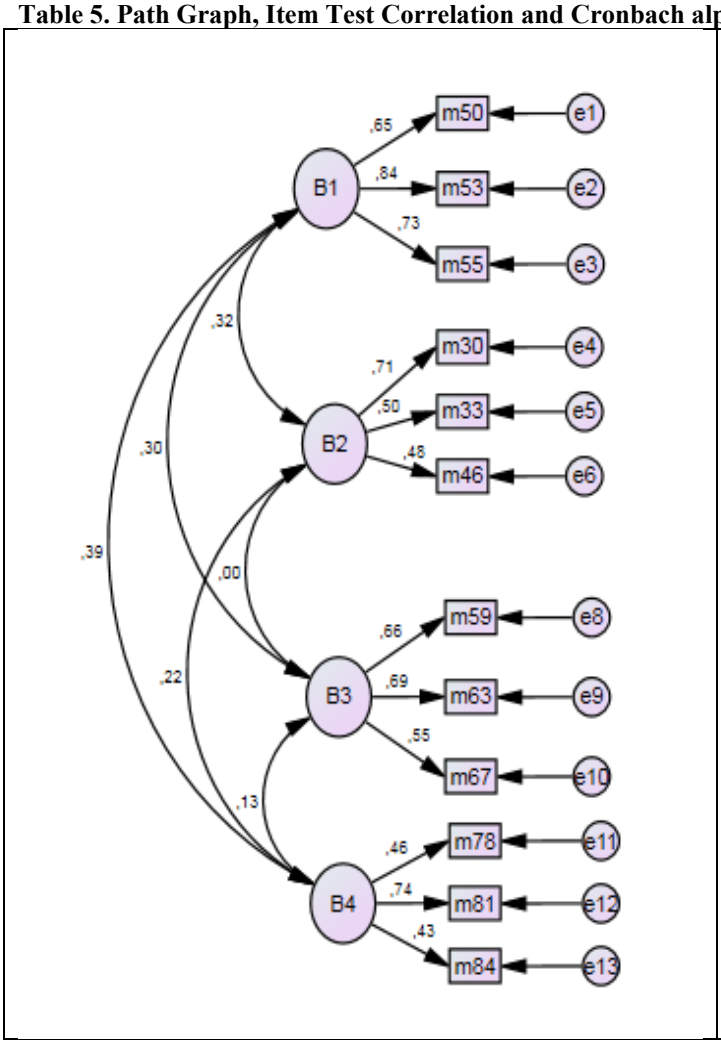
Table 4. Digital Well-being scale confirmatory factor analysis model goodness of fit index values

	Threshold Value			
	Measurement Values	Good Fit	Acceptable	Compliance
χ^2	62.24			
sd	48			
p	0.081	0.05 – 1.00	0.01 – 0.05	good
χ^2 / sd	1.30	0 - 2	2 - 3	good
RMSEA	0.044	0.05	0.06-0.08	good
SUMMER	0.064	0 – 0.05	0.05	acceptable
NFI	0.84	0,95 - 1.00	0.90 – 0.95	Kötü
NNFI	0.95	0.97 – 1.00	0.95 -0.90	acceptable
CFI	0.96	>0.97	>0.95	acceptable
GFI	0.94	>0.90	0.89 – 0.85	good
AGFI	0.94	>0.95	>0.90	acceptable

Source: Erkorkmaz et all., (2013).

When Table 4 was examined, RMSEA value was calculated as 0.044; SRMR value, 0.08; NFI value, 084; NNFI value, 095; CFI value, 0.96; GFI value, 0.94; AGFI value, 0.94. It was found that RMSEA, SRMR, NNFI, CFI, and AGFI values were among the Decient and acceptable values except for the NFI value. They calculated the chi-square ratio to the degree of freedom as χ2 /sd ratio 1.30, which indicates that the model data fit is perfect. When the results were evaluated as a whole, it was revealed that the model was suitable for the data set as the original four-factor model proposed for the scale. The path graph and reliability values of the four-factor scale are shown in Table 5.

Table 5. Path Graph, Item Test Correlation and Cronbach alpha values



	Item Test Correlation	Cronbach alfa
Smartphone		
M1-30	.467	.565
M2-33	.350	
M3-46	.313	
Computer		
M4-50	.556	.775
M5-53	.688	
M6-55	.602	
Facebook		
M7-59	.460	.662
M8-63	.541	
M9-67	.425	
Technology		
M10-78	.292	.566
M11-81	.436	
M12-84	.326	

Table 6. Descriptive Analysis Results

		Descriptive Values		Skewness		Kurtosis	
	N	Mean	Sd.	Value	Sh.	Value	Sh.
Smartphone	157	3.263	.946	-.156	.194	-.737	.385
M1 (m30)	157	3.471	1.318	-.549	.194	-.857	.385
M2 (m33)	157	3.019	1.318	-.002	.194	-1.189	.385
M3 (m46)	157	3.299	1.243	-.384	.194	-.857	.385
computer	157	2.531	1.192	.320	.194	-.917	.385
M4 (m50)	157	2.771	1.502	.145	.194	-1.478	.385
M5 (m53)	157	2.274	1.294	.753	.194	-.523	.385
M6 (m55)	157	2.548	1.500	.438	.194	-1.324	.385
Facebook	157	2.495	1.090	.533	.194	-.558	.385
M7 (m59)	157	1.955	1.384	1.242	.194	.107	.385
M8 (m63)	157	2.790	1.368	.037	.194	-1.315	.385
M9 (m67)	157	2.739	1.477	.158	.194	-1.389	.385
Technology	157	3.028	1.029	-.146	.194	-.401	.385
M10 (m78)	157	2.962	1.325	.004	.194	-1.173	.385
M11 (m81)	157	2.809	1.410	.261	.194	-1.243	.385
M12 (m84)	157	3.312	1.544	-.314	.194	-1.432	.385

When Table 6 is examined, the mean values of the items vary between 1.96±1.38 and 3.47±1.32 Dec. The highest item average is "Using a smartphone makes me happy. " The item is; if the lowest item is average, "using Facebook makes me happy." it belongs to the substance.

Results

Scale dimensions According to the department studied by university students, it has been concluded that only the Facebook dimension is effective in digital well-being.It is seen that this affects the digital well-being of students studying PDR and Special education teaching. In the research conducted by Roffarello and Russis (2019), it has been found that digital well-being practices are useful in solving some special problems that are appreciated. However, they have been found insufficient in forming new habits and restricting smartphone use. Thus, it has been concluded that these applications do not help to change the behaviour of users related to smartphones.It was concluded that there is no effect on digital well-being in using scale dimensions, social media for communication, gaming, etc.Successful ageing through digital games, socio-emotional differences between older adults who play digital games and older adults who do not play, and differences such as well-being, depression, and social functioning between older adults who play digital games and those who do not play were examined. Decatur University, Istanbul, Decatur University, Istanbul. As a result of the study, it was found that older adults who play digital games in terms of well-being, social functioning and depression exhibit more successful ageing than those who do not play (Allaire, McLaughlin, Trujillo, Whitlock, Porte & Gandy, 2013).In the case of using scale dimensions and social media for leisure purposes, the "Facebook" dimension seems to affect digital well-being to research social media.In a study, the motivation of people who communicate with social networks is high, making them feel excellent about themselves (Kross et al., 2013).In another study, Facebook usage increases users' motivation, but passive Facebook reduces users' motivation (Wenninger et al., 2014). Another study found that choosing online communication for socialization rather than face-to-face communication gives many negative results (Caplan, 2003).It turned out that scale dimensions did not affect digital well-being in the cases of providing internet access with a wired and wireless connection.It was concluded that ADSL's provision of scale dimensions and Internet access did not positively affect digital well-being.When it is examined to provide scale dimensions, internet access by satellite, and the size of a smartphone, it seems that it does not affect digital well-being.When their responses to the scale dimensions are examined to compare them according to the provision of internet access with 3G, the Facebook dimension shows the effect of digital well-being in providing internet access with 3G.It is seen in the size of Facebook from the scale dimensions that provide internet access with 3G in digital well-being.When their responses are examined to compare the scale dimensions according to the state of using the Internet for following current news, the digital well-being of the participants and the smartphone-sized state of using the Internet to follow up on current news affects their digital well-being. It has been concluded that there is no relationship between scale dimensions and digital well-being in the case of smartphone and tablet ownership.Studies conducted in the literature have shown that using digital technology, especially the Internet, can reduce loneliness and increase well-being. another study conducted on 32 older adults for six months found a positive relationship between the frequency of technology use and emotional attachment and the frequency of technology use and the perceptions of self-worth. Dec.When the scale dimensions, laptop and desktop computer ownership, and the participant's responses to the scale dimensions were examined, the digital well-being states, according to the state of having a laptop computer, there is no effect on their state of physical well-being.While recent studies have focused on the concrete benefits of online participation, subjective quality of life is also seen as an output of digital environments. In another study conducted in this context, as a result of evaluating the social well-being of an individual, as a result of studies on digital participation, potential and perception differences, it was concluded that the perception of digital belonging directly increases social well-being and digital potentially develop internet skills indirectly (Büchi et al., 2018).When the participants' responses to the scale dimensions were examined to compare the scale dimensions according to the status of being on Facebook, Twitter and Instagram, the digital well-being states seemed that it is not effective in the case of Facebook membership.A study by Orben & Przybylski (2019), which examines the relationship between adolescent well-being and digital technology use, shows that young people's widespread use of digital technology negatively triggers and affects their psychological well-being. In the study conducted on the effects of digital technologies on adolescents, when large-scale social data sets were analyzed Decently, it was found that there are negative relationships between the use of digital technology and the well-being levels of adolescents. Children and Digital Well-being in Australia: Online Regulation, behaviour and Competence in a study called Online Regulation, behaviour and Competence studied with families who have an Internet connection and use the Internet daily with their children. As a result, only children are informed and active, moral and critical online participants in addition to protection measures against the risks that children may face (Nansen, Chakraborty, Gibbs, MacDougall & Vetere, 2012).

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