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Technology Use Inventory Parent Form for Primary School Students: Validity and Reliability Study

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Abstract

This inventory was developed to determine the areas and situations of technology use of primary school students. Within the scope of the validity and reliability study of the scale, 310 parents of students from different socio-economic levels studying in a primary school in Istanbul province were included as the study group. In the analysis of the data, in addition to descriptive statistics, comparisons between groups were made and independent t-test and one-way analysis of variance statistical techniques were used according to the number of groups. In terms of the validity of the study, firstly, content validity was tried to be determined. Necessary adjustments were made by examining the KMO, KMÖ and KGI values of each item in the inventory. The content validity index for the inventory was found to be 0.91. Face validity was also conducted together with content validity based on expert opinions. As a result of the feedback obtained, the scale was finalized. Simple regression analysis technique was used for predictive validity. It was observed that the inventory formed a significant and high correlation (0.83) with the skills of using web2.0 design tools and technology in the courses, and that it explained and predicted 69% of

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these skills. The results of the KMO Bartlett's test (0.94), which was conducted in the context of construct validity, showed that the study could be generalized to the population, while the results of the factor analysis revealed that the scale consisted of a single factor. The ratio of the single factor explaining the total variance was calculated as 48%. Internal consistency coefficients were examined to determine the reliability level of the scale; Cronbach Alpha coefficient was calculated as .92 and Split-Half Coefficient coefficient was calculated as. 88.

Keywords: Technology, Inventory, Scale, Validity, Reliability, Parent Form.

Introduction

In a world where science and technology are developing rapidly, the scope of information and the speed of access to information are constantly changing, and societies are trying to keep up with this development in order to meet their needs (Dargut and Çelik, 2014, 29; Seferoğlu, 2009, 12; Yavuz and Coşkun, 2008, 277). For this reason, although it takes place at all levels of the education system, which has the duty and responsibility of educating the manpower of societies, it is expected to provide students, especially at the basic education level, with the skills of accessing information, using information effectively, meeting individual needs, reaching the target easily and most importantly, using technology effectively for these purposes (Seferoğlu, 2009, 13; Dargut and Çelik, 2014, 277).

In general terms, the use of technology in education, on the one hand, tries to make the lessons more interesting, on the other hand, it focuses on reaching the goals of the students in an effective and efficient way without wasting time, ensuring the permanence of what they have learned, and also raising them as individuals who know how to use technology (Katrancı and Uygun, 2013, 775; Seferoğlu, 2009). When it is considered in terms of the skills to be gained by students, the point that should be emphasized is to raise individuals who use technology and the Internet effectively and with a clear purpose within the specified time without cognitive or behavioral disturbance (Eşği, 2014, 808). Because healthy internet users are individuals who can distinguish between real life communication and communication in the internet environment (Davis, 2001, 189).

Unhealthy, unconscious internet use can negatively affect individuals' daily life, cognitive, social and emotional development (Tüzün, 2002, 47; Eşği, 2014, 809). Despite the view that especially children's introduction to technology at a young age can be beneficial for them, there are increasing opinions that technology can be harmful to their development and health if it is not used properly (Arısoy, 2009, 56; Griffiths, 1999, 247). Among the harmful consequences of unconscious/unhealthy internet use, one of the

most emphasized ones is to face addiction as a result of the continuity of uncontrolled use (Mustafaoğlu, Zirek, Yasacı and Özdinçler, 2018, 231).

Although the concept of Internet addiction was first expressed by Goldberg in 1995, some scientific discussions agree that Young was the first to bring up the concept of "Internet Addiction Disease" (Eşği, 2014, 808). Today, with the widespread use of technology, the number of behavioral addictive situations in children such as computer games, television and mobile phones has gradually increased. The prolonged time allocated to games on technological devices also leads to a decrease in children's face-to-face communication and group interactions with their peers (Mustafaoğlu, Zirek, Yasacı and Özdinçler, 2018, 232; Rosen et al., 2014, 368). It can be said that children, who observe that "violence" is a problem-solving tool especially in violent digital games and think that any means can be used for leadership/domination, become passive recipients after a certain time, reduce contact with their environment, and turn into individuals who argue with their parents about discipline (Toran et al., 2016, 2265).

When the literature on the use of technology is examined, it is seen that the negative effects of internet and screen addiction (Morahan and Schumacher, 2000; Treuer, Fabian Fu'redi, 2001; Niemz, Griffiths and Banyard, 2005; Yang and Tung, 2007; Armstrong and Phillips and Sailing, 2000; Koch and Pararelli, 2004; Esen, 2007; Whang, Lee and Chang, 2003; Nalwa and Anand, 2003; Young and Rodgers, 1998; Bayraktar, 2001; Sandersi Field, Diego et al. , 2000; Kim, Ryu, Chon et al., 2006; Branner, 1997; Soule, Shall and Kleen, 1997; Ayaroğlu, 2002; Frantom, Green and Hoffman, 2002; Becker and Maunsaiyat, 2002; Vandewater et al., 2007; Rideout, Saphir, Tsang and Bozdech, 2011; Tuncer and Yalçın, 1999; Arnas, 2005; Gürcan, Özhan and Uslu, 2008; Akçay and Özcebe, 2012. Some of these studies reveal the negative effects of internet addiction on children's self-confidence (Morahan and Schumacher, 2000, 17; Treuer, Fabian Fu'redi, 2001, 283; Niemz, Griffiths and Banyard, 2005, 16; Yang and Tung, 2007, 81). In Koch and Pararelli's (2004) study, it is emphasized that peer bullying occurs in children who spend too much time on the screen, and in Esen's (2007) study, it is emphasized that the desire to be alone and introversion are observed in children who are exposed to the screen too much. Apart from these, Whang, Lee and Chang (2003, 145) state that depression tendency emerges in technology-addicted children, and Bayraktar (2001) states that internet addiction affects child and adolescent development. Vandewater et al. (2007, 1008) emphasize the increase in the time spent by young children in front of the screen, while Rideout, Saphir, Tsang and Bozdech (2011) emphasize the increase in screen use and internet addiction over the years.

In general, studies on the effects of technological tools on children also vary in the literature. Sevindik (2011) found that children who watch television for a long time cannot use their mental activities

effectively in games; Zimmerman and Christakis (2007, 987) found that children who start watching television at an early age face distraction problems in primary school; Mistry, Minkovit, Strobino and Borzekowski (2007, 763) conducted studies on behavioral disorders that may occur in children who watch television for a long time. In addition to these, Cordes and Miller (2000) found that children who spend too much time in front of the computer have attention deficit, problems in language acquisition, inability to think creatively and a significant decrease in academic achievement; İşçibaşı (2011, 125) found that children's easy access to illegal, violent sites on the internet creates a ground for communicating with dangerous people and game addiction; Provenzo (1992, 57) studied the effect of violent video games on children's aggression and Yen et al. (2009, 866) showed that children who spend too much time with smartphones have a decrease in academic achievement.

Although there are more than one study on the effects of technology on children in the literature, there is no scale study on how and for what purpose primary school students use technology, especially based on parents' opinions. Therefore, in the context of a project carried out within the scope of guidance and psychological counseling in this research, it will both determine the status and level of technology use of primary school students and provide the need in the field by developing a valid and reliable technology use inventory parent form. In this direction, answers to the following questions were sought during the research:

1. To what extent is the developed technology use inventory parent form valid?

2. To what extent is the developed technology use inventory parent form reliable?

3. How are the results of the developed technology use inventory parent form in terms of student grade and gender variables?

Method

Ethics charter

Before starting this study, the Scientific Research and Publication Ethics Directive of Higher Education Institutions was followed. Scientific ethics and rules were followed at all stages of the study. Necessary permissions were obtained before starting the study. After the study was started, a consent form was prepared and applied for the parents of the students. Parents who did not give consent were not included in the study. Parents were informed throughout the study and feedback was given continuously at every stage of the study. The data analysis was objective and the researchers did not reflect their own views and

opinions in any way. The data obtained were not altered in any way, and statistical analyses were performed by transferring them to the SPSS program as they were.

Research model

In the research, the technology usage inventory was applied to the parents of the 1st, 2nd, 3rd and 4th grades of primary school level and the data obtained after the application were analyzed and the current situation regarding the technology usage of the students was determined without changing the way it exists, so the model of the research is the general survey model. The general survey model includes scans conducted on the whole universe or a sample taken from the universe in order to make a general judgment about the universe in a universe containing a large number of elements (Karasar, 2006). Single or relational scans can also be conducted through general survey models (Bekman, 2022, 249). According to Karasar (2012), research models conducted to determine the single occurrence of variables are called "single survey models". With single survey models, changes and developments occurring over time can be determined in addition to determining the instant situation.

Working group

The population of this study consisted of the parents of primary school students attending private and public schools in Turkey, and the sample consisted of 310 parents of students attending a public school in Istanbul who voluntarily participated in the study. Since the study was applied to the students in the school where one of the researchers worked, the convenience sampling method was chosen. The sample group included 60 first grade, 65 second grade, 85 third grade, and 100 fourth grade student parents. There are 156 female students and 154 male students in the research group.

Data Collection Tools and Processes

The developed data collection tool was applied to 310 parents of 310 students studying at an existing primary school in Istanbul between March 2023 and May 2023 in the 2022-2023 academic year. In the application, the parents of the students who were present in the school and willing to participate in the research were preferred and completely voluntary. As a data collection tool, the "Inventory for Primary School Students' Use of Technology" consisting of 15 items was used by the researchers. After creating the inventory, the researchers finalized the scale by presenting it to thirteen different experts. After the expert opinion, KMO, KMÖ and KGI values were calculated. The overall content validity index of the scale was found to be approximately 0.91. Before starting the implementation, the necessary permissions were obtained, the environment where the scale would be applied was physically ready for the application,

and the application was started after all preparations were completed. Just before the implementation, the scale was applied to 10 parents of students as a pilot to check the level of comprehensibility, and the actual implementation was started after the necessary feedback was received. In addition, the researchers were present in the application area to avoid any problems during the application of the scale and to prevent any problems that may arise at the level of comprehensibility of the scale items. The implementation of the scale took approximately 20 minutes. The scale was personally administered by the researchers in order to avoid any data loss. As a result, there was no loss of data in any way.

Data Analysis

SPSS 26 (The Statistical Packet for Social Sciences) package program was used to perform statistical analyses with the data obtained after the inventory was applied. Within the framework of this program, the frequency of the applied study group, normality test of the scale, validity and reliability studies and demographic analysis were conducted. While the data were transferred to the program, no changes were made by the researchers on the scale application program. The researchers did not reflect their own comments and opinions on the answers to the scale questions, and did not make any attempt to influence or change the decision of the people to whom the application was made.

Findings and Interpretation

In the first sub-problem addressed in the study, the validity of the parent form of the technology use inventory developed to evaluate primary school students was examined. First, it was checked whether the test had a normal distribution, and then other statistical procedures were started. The results of the analysis of the normality distribution of the test are given in (Table 1).

Technology Use	**Kolmogorov-Smirnov[a]**		
Inventory	**Statistics**	**sd**	**p**
	,042	310	,053

Table 1: Normality Test Results of the Scale.

When Table 1 is examined, it is seen that the p value is α=.053 (p>0.05). If the sample size is larger than 35, Kolmogorov Smirnov test is more appropriate; if it is smaller, Shapiro Wilk test is more appropriate

(McKillup, 2012; Shapiro & Wilk, 1965). When the p value calculated as a result of the test is greater than α=.05, it is interpreted as evidence that the scores come from a normal distribution at the significance level (Mertler & Vannatta, 2005).

Scope validity and expert opinion

In the context of content validity in the study, on the one hand, a pilot study was conducted with 10 student parents to cover all grade levels, and on the other hand, opinions of 13 different field experts (1 professor, 2 associate professors, 2 lecturers, 4 psychological counselors, 3 classroom teachers, 1 Turkish teacher) were received and finalized.In line with the expert opinions, KMO, KMÖ and KGI values were calculated and the overall KGI was found to be 0.91.

Construct validity and factor analysis results

Factor analysis is one of the most important analyses used to demonstrate the quality and validity of measurements. The main purpose of factor analysis is dimension reduction. The important points here are; which factor analysis will be used and which statistical tools will be used in the factor analysis. The method to be applied affects the results of the research and accordingly the "construct validity" that is tried to be measured (Yaşlıoğlu, 2017, 75).

Not every variable and data collection may be suitable for factor analysis. Therefore, several tests are required for the suitability condition. Especially in evaluations, the number of samples and expressions is important as a prerequisite. In this context, it is important that the sample size is larger than the number of variables, the sample size should be at least 50, and the number of observations per statement should be kept high (Yaşlıoğlu, 2017, 77-78; Kalaycı, 2006; Hair et al., 2010).

In this study, the answers given by the parents of 310 students in a public school were utilized for the construct validity of the technology use inventory applied to parents regarding the technology use status of children at primary school level. The data obtained from the scale were transferred to the SPSS 26 package program and subjected to factor analysis. Analyses were made on how many factors the scale consisted of, the loadings of the factors, their contribution to the variance, and the factors' explanatory status of the total variance. Principal Component Analysis was used to determine how many factors the scale consists of and the loadings of the factors that make up the scale. In addition, KMO and Bartlett's Test were conducted to test sampling adequacy. Table 2 shows the results of KMO and Bartlett's Test:

	N	Chi square	KMO
Technology Use Inventory	310	1467,62	938

Table 2: KMO and Bartlett's Test Results.

Table 2 shows that the KMO and Bartlett's test result of the scale is .938. According to the related literature, Bartlett's test is one of the most important tests for suitability for factor analysis. Bartlett's test examines the statistical significance of this correlation matrix by examining the previous correlation matrix. In other words, the KMO test is the test that measures the correlations between variables and the suitability of factor analysis. The value of the KMO test can take values between 0 and 1, and if the KMO value is estimated without error, it is equal to 1. Values above 0.8 can be considered excellent (Büyüköztürk, 2002, 475; Yaşlıoğlu, 2017, 77-78). However, in order to make an in-depth interpretation, it is more appropriate to exclude the statements with KMO values below 0.50 from the research and continue the factor analysis in that way (Hair et al., 2010). According to this result obtained in this direction, it was concluded that the scale has a value above 0.8 and can make a very good measurement. In addition, the fact that the distribution was above 0.50 was interpreted as the sample represented the universe and the findings obtained from the scale could be generalized to the universe. Then, factor analysis was conducted to examine the main components of the scale and the factor loadings of these main components. Table 3 shows the results of the factor analysis of the scale:

Key Components	Factor Load
Article 1	,48
Article 2	,43
Article 3	,55

Article 4	,41
Article 5	,44
Article 6	,69
Article 7	,52
Article 8	,49
Article 9	,52
Article 10	,69
Article 11	,58
Article 12	,51
Article 13	,57
Article 14	,71
Article 15	,70

Table 3: Factor Analysis Results of the Scale.

As seen in Table 3, the factor loadings of the items in the scale vary between 0.41 and 0.71. There is no scale item with a very low correlation value, and it can be said that the items generally have a medium or above medium factor loading. The sub-dimensions of the scale and their contribution to the total variance are given in Table 4:

Elements	Self-value	Contribution to Variance	Total Variance
1	7,20	48,01	48,01
2	1,08	7,17	55,18
3	,82	5,47	60,65
4	,78	5,20	65,84
5	,76	5,03	70,88
6	,64	4,29	75,17
7	,62	4,10	79,27
8	,53	3,56	82,82
9	,51	3,42	86,24
10	,44	2,91	89,15
11	,41	2,76	91,92
12	,38	2,51	94,43
13	,33	2,23	96,65

14	,26	1,72	98,37
15	,25	1,63	100

Table 4: Subscales of the Scale and Ratios of Explaining Total Variance.

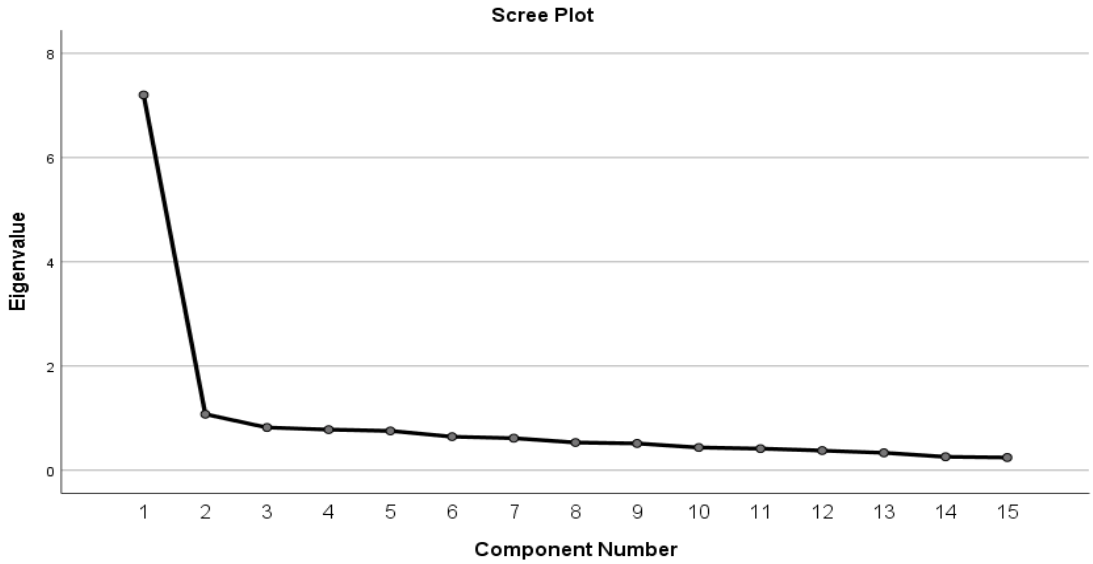

Figure 1: Slope-Deposition Graph.

When the sub-dimensions in Table 4 and their contributions to the total variance and the scree-slope-difference graph in figure 1 are examined, it is seen that the scale is largely composed of a single factor and can measure the areas it wants to measure with a single-factor structure. When the eigenvalues of the factors were examined, although a second factor with an eigenvalue of 1.02 was observed, it was adopted that this eigenvalue remained at a borderline value, did not provide a very important break, did not make a very important contribution, and that a single-factor structure created a stronger and more robust structure. Table 5 shows the results of the Pearson product-moment correlation analysis of the relationship between the scale items:

		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15
A1	r	**1**	,488**	,502**	,265**	,383**	,325**	,441**	,412**	,447**	,438**	,456**	,442**	,479**	,544**	,538**
	p		,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000
A2	r	,488**	**1**	,417**	,387**	,278**	,224**	,413**	,392**	,427**	,452**	,365**	,420**	,355**	,531**	,465**
	p	,000		,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000
A3	r	,502**	,417**	**1**	,394**	,380**	,386**	,553**	,435**	,420**	,371**	,503**	,314**	,429**	,553**	,568**
	p	,000	,000		,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000
A4	r	,265**	,387**	,394**	**1**	,329**	,335**	,427**	,402**	,305**	,386**	,442**	,366**	,372**	,488**	,395**
	p	,000	,000	,000		,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000
A5	r	,383**	,278**	,380**	,329**	**1**	,363**	,375**	,355**	,360**	,298**	,460**	,321**	,431**	,393**	,454**
	p	,000	,000	,000	,000		,000	,000	,000	,000	,000	,000	,000	,000	,000	,000
A6	r	,325**	,224**	,386**	,335**	,363**	**1**	,294**	,384**	,168**	,165**	,296**	,337**	,251**	,372**	,351**
	p	,000	,000	,000	,000	,000		,000	,000	,003	,004	,000	,000	,000	,000	,000
A7	r	,441**	,413**	,553**	,427**	,375**	,294**	**1**	,503**	,457**	,426**	,549**	,417**	,482**	,485**	,547**
	p	,000	,000	,000	,000	,000	,000		,000	,000	,000	,000	,000	,000	,000	,000

A8	r	,412**	,392**	,435**	,402**	,355**	,384**	,503**	**1**	,412**	,409**	,452**	,385**	,426**	,544**	,458**
	p	,000	,000	,000	,000	,000	,000	,000		,000	,000	,000	,000	,000	,000	,000
A9	r	,447**	,427**	,420**	,305**	,360**	,168**	,457**	,412**	**1**	,506**	,435**	,454**	,440**	,505**	,497**
	p	,000	,000	,000	,000	,000	,003	,000	,000		,000	,000	,000	,000	,000	,000
A10	r	,438**	,452**	,371**	,386**	,298**	,165**	,426**	,409**	,506**	**1**	,468**	,538**	,513**	,632**	,629**
	p	,000	,000	,000	,000	,000	,004	,000	,000	,000		,000	,000	,000	,000	,000
A11	r	,456**	,365**	,503**	,442**	,460**	,296**	,549**	,452**	,435**	,468**	**1**	,440**	,605**	,645**	,655**
	p	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000		,000	,000	,000	,000
A12	r	,442**	,420**	,314**	,366**	,321**	,337**	,417**	,385**	,454**	,538**	,440**	**1**	,542**	,533**	,535**
	p	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000		,000	,000	,000
A13	r	,479**	,355**	,429**	,372**	,431**	,251**	,482**	,426**	,440**	,513**	,605**	,542**	**1**	,597**	,640**
	p	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000		,000	,000
A14	r	,544**	,531**	,553**	,488**	,393**	,372**	,485**	,544**	,505**	,632**	,645**	,533**	,597**	**1**	,708**
	p	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000		,000
A	r	,538**	,465**	,568**	,395**	,454**	,351**	,547**	,458**	,497**	,629**	,655**	,535**	,640**	,708**	**1**

15	p	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	

Table 5: Pearson Product Moment Correlation Analysis.

Table 5 shows that there is a positive correlation between all items of the scale. The double asterisks in the correlation values indicate that the items show a significant relationship with each other at p<0.001 level. It is understood from the table that almost all of the items have a moderate correlation with each other. In this respect, it can be said that the scale items give close measurements to each other, the scale consists of items that are generally compatible with each other, in other words, each item serves the same purpose in a similar way.

Face validity of the scale

Face validity is the appearance that a measurement tool seems to be able to measure the situations it wants to measure, or in other words, when it is checked quickly from every angle, there is no problem that prevents it from measuring the qualities desired to be measured (Yüksel and Çeliköz, 2021, 164). Thirteen experts were consulted to determine the face validity of the technology use inventory developed to be applied to parents to evaluate primary school students and the following questions were sought:

1. Does the inventory seem to accurately measure the main feature it wants to measure?

2. Do the questions in the inventory seem appropriate for an elementary school child's use of technology?

3. Is the scale descriptive and useful for the parents?

4. Is the scale easy to control for users?

The answers given by the experts to the above questions are basically as follows:

1. The scale seems to accurately measure the characteristic it seeks to measure.

2. The technology use situations in the inventory seem to be appropriate for the level of primary school students.

3. The scale is seen as descriptive and useful by the users.

4. The scale seems easy to be understood by the users.

5. The language of the scale is correct and understandable.

6. There are no spelling mistakes and scientific errors in the scale.

7. Users can easily find the dimension of the scale in which they have left off.

8. The instructions are very clear. Scale users can easily understand what needs to be done.

It was concluded that the inventory, which was finalized by making the necessary corrections in line with the expert opinions, seems to measure the purpose it wants to measure and there is no obstacle to start the measurement process.

Predictive validity of the scale

Prediction is the situation of making predictions about the future based on the current situation. According to parent views, predictive validity was examined as another validity study of the inventory prepared to determine the technology usage status of primary school students. Predictive validity aims to help to have information about the future based on the current measurement result. Within the scope of predictive validity, it was tried to determine the degree to which the scores that students received from the technology use inventory prepared within the scope of the research predicted the end-of-semester teacher observation scores, which is a real situation and reveals the use of web2.0 design tools in their lessons. For this purpose, after collecting the data with the inventory, the class teachers of the relevant students were contacted and an observation form was distributed to determine their skills in using web2.0 design tools and technology in the lessons in general, centering on their end-of-semester situation as the near future. Teachers were asked to rate their students' skills from 1 to 5. In line with the feedback received, the data were transferred to the SPSS program and a simple regression analysis was performed to reveal the degree to which the scores obtained from the inventory predicted the technology usage skills in the lessons and presented in Table 6:

	N	r	r^2	F	p
Regression Analysis Results	310	,829	,688	679,3	0,00

Table 6: Regression Results Regarding the Predictive Validity of the Technology Use Inventory Developed for Primary School Students.

In table 6, the correlation coefficients between the score values in the observation form given to the teachers regarding the use of technological tools and web design tools used in the lessons by primary school students and the answers given by the students' parents in the technology use inventory were examined. Accordingly, it was determined that there was a significant and high correlation between the students' use of technology in the classroom and the answers given in the technology inventory ($r=0.83$; $p<0.05$). It can be said that inventory scores explain 69% ($r^2=0,688$) of students' technology usage skills. Based on these results, it can be concluded that the inventory can accurately identify students' technology use areas and situations and has a very good level of predictive validity.

Reliability of the scale

In order to determine the reliability of the technology use inventory developed to be applied to primary school students, the internal consistency of the scale was examined and the reliability level was tried to be determined by Cronbach Alpha reliability and test split methods.

Examination of the scale in terms of ınternal consistency

The reliability of the scale was examined using two different methods. The first is the Cronbach Alpha method and the second is the test split reliability calculation method. Guttman Split-Half Coefficient was calculated for test split reliability. Table 6 shows the reliability results calculated with both methods:

	N	**r**	**r^2**	**F**	**P**
Regression Analysis Results	310	,829	,688	679,3	0,00

Table 6A: Regression Results Regarding the Predictive Validity of the Technology Use Inventory Developed for Primary School Students.

In table 6A and B, the correlation coefficients between the score values in the observation form given to the teachers regarding the use of technological tools and web design tools used in the lessons by primary school students and the answers given by the students' parents in the technology use inventory were examined. Accordingly, it was determined that there was a significant and high correlation between the students' use of technology in the classroom and the answers given in the technology inventory ($r=0.83$; $p<0.05$). It can be said that inventory scores explain 69% ($r^2=0,688$) of students' technology usage skills.

Based on these results, it can be concluded that the inventory can accurately identify students' technology use areas and situations and has a very good level of predictive validity.

Reliability of the scale

In order to determine the reliability of the technology use inventory developed to be applied to primary school students, the internal consistency of the scale was examined and the reliability level was tried to be determined by Cronbach Alpha reliability and test split methods.

Examination of the scale in terms of ınternal consistency

The reliability of the scale was examined using two different methods. The first is the Cronbach Alpha method and the second is the test split reliability calculation method. Guttman Split-Half Coefficient was calculated for test split reliability. Table 6 shows the reliability results calculated with both methods:

Scale	**Cronbach Alpha**	**Split-Half Coefficient**
Technology Use Inventory	,92	,88

Table 6B: Cronbach Alpha and Test Split Reliability Results.

As a result of the analysis, Cronbach Alpha value was calculated as α=.92. In addition to determining the Cronbach Alpha coefficient, the reliability (Guttman Split-Half Coefficient) coefficients obtained by dividing the items into two equivalent halves were also calculated. Accordingly, the Guttman value (Guttman Split-Half) was calculated as G=,88. According to Özgüven (1994), in order for a measurement tool to be used in scientific research, the reliability coefficient should be at least 70-80. Based on the information in the literature, it is possible to conclude that the reliability level of the scale is quite high.

Demographic analysis of the scale

Students' technology use was analyzed in terms of gender and class variables, and possible differences were interpreted in terms of the expected effect. First, an independent t-test was conducted to determine whether the gender factor had an effect on the technology use of the scale. Table 7 shows the t-test results:

	Gender	N	X	SS	t	p
Technology Usage Status	Female	156	52,93	13,68	,36	,722
	Male	154	52,42	11,66		

Table 7: t-Test Results Regarding the Comparison of Primary School Students' Technology Usage Areas According to Gender

1) 15.00 - 27.00 (Nothing)

(2) 27.01 - 39.00 (Less)

(3) 39.01 – 51.00 (Middle)

(4) 51.01 - 63.00 (Quite)

(5) 63.01 – 75.00 (Tam)

When Table 7 is examined, it is observed that there is no significant difference between male and female students' use of technology (t=,36; p>0,05). In other words, both male and female students' use of technology is in the "Quite (4)" category and their level of spending time with technology is similar to each other. Considering the new generation called digital natives, there are also inferences that the gap between male and female users is decreasing day by day (Dresang, Gross, & Holt, 2007). In today's technologies, applications used in all technologies such as computers, tablets, smartphones, etc. show a variety of types to cover every person. There are thousands and tens of thousands of applications that appeal to individuals in every field such as movies, music, sports, lessons, games, shopping, productivity, etc. Therefore, regardless of gender, everyone can find applications to spend time, use and benefit from technology in some way. For this reason, as expected, it can be said that there is no difference in the level and use of technology between boys and girls. In other words, it is thought that the gender variable did not have a significant effect on technology use. On the other hand, there may be more than one reason why male and female students spend a lot of time with technology in a similar way. According to Bayraktutan (2005) and Kelleci (2008, 254), children who do not have a healthy communication environment within the family, who experience family unrest, who experience social loss or have few

friends, and whose academic achievement is not high may see the Internet as an escape. Again, according to Cömert and Ögel (2009), early onset of problematic internet use can lead to addiction in the future. Chatfield (2013), in a study conducted by the Kaiser Family Foundation with more than two thousand children at ten-year intervals, emphasizes that while the time children spent with technology in a day was six hours and twenty-nine minutes in 1999, it increased to ten hours and forty-five minutes ten years later. The study addresses the problem that children who use technology for more than ten hours a day spend little time for self-knowledge, understanding, listening and development. Dinç (2015, 51), in his study on the physical development of children, states that individuals who use technology more than necessary first sacrifice sleep and sleep less in order to spend more time with the internet, television or digital games; this situation causes negativities in the psychological and physical development of children.

After the comparison based on gender, the second comparison was made in terms of class level, which is another demographic element of the inventory. The results of one-way analysis of variance for comparisons related to class level are given in Table 8:

	Classroom	**N**	**X**	**SS**	**F**	**p**
Technology Use Status	1. classroom	60	50,97	15,65		
	2. classroom	65	54,05	12,30	0,84	,473
	3. classroom	85	53,58	11,81		
	4. classroom	100	52,67	11,71		

Table 8: Analysis of Variance Results Based on the Comparison of Technology Use Areas According to Students' Grades.

(1) 15.00 - 27.00 (Nothing)

(2) 27.01 - 39.00 (Less)

(3) 39.01 – 51.00 (Middle)

(4) 51.01 - 63.00 (Quite)

(5) 63.01 – 75.00 (Tam)

Table 8 shows that there is no significant difference in primary school students' use of technology based on grade level. This situation can be explained by the fact that it includes thousands and tens of thousands of applications in a way to cover the individual differences and age differences of all students, independent of the class variable as in the gender variable, and that it has a variety that can appeal to all students. Similarly, Seferoğlu and (2019, 12-13), Dargut and Çelik, (2014, 29) emphasized the necessity for students, especially at the basic education level, to effectively use the skills of accessing information, using information effectively, meeting their individual needs, reaching the goal easily, and most importantly, using technology effectively for these purposes.

Conclusion and Recommendations

In the light of the findings obtained from the research, the following conclusions were reached:

The technology use inventory developed to be applied to primary school students in line with the parents' opinions was found to have a normal distribution, content and face validity, a single-factor structure, validity in predicting technology use skills, high Cronbach Alpha and Test split reliability, and the technology use inventory was not affected by students' gender and class differences as expected.

As a result, this inventory, which was prepared to determine the technology use status and differences of students in primary schools in line with parents' opinions, is a valid and reliable measurement tool. Since it provides valid and reliable results, it can be suggested that it can be easily used by everyone for the purpose of use. In the literature, there are opinions that children should not use computers and the Internet until the age of 7 in order to fulfill their developmental tasks. On the other hand, in publications with these views, it is recommended not to completely restrict the use of computers and the Internet. It is emphasized that children need some controlled and productive experiences in order to gain a perspective on computers and the Internet and to create awareness in them (Ceyhan & Ceyhan, 2011). According to the findings of a study conducted in Turkey by the European Children Online Project, children between the ages of 9 and 16 started using the Internet around the age of 10 and used the Internet for an average of 1-1.5 hours a day. It was observed that the Internet was mostly used for school-related tasks (92%), while other activities such as playing games (49%), following the news (40%), watching entertainment and video clips (59%), downloading music or movies (40%), and sharing with peers on social networks (48%) were also common (Akbulut, 2013, 55).

Technology Use İnventory Parent Form

Dear parents, use this inventory to determine what your child does with technological devices at home. On the line given, mark with an X where you stand when you evaluate your current practice.

Not Using Technology Correctly:	**Using Technology Correctly:**
For my child, spending time with technological devices at home is more enjoyable than spending time with family members and friends.	When my child spends time at home with family members and friends, it does not occur to them to use technological devices.
My child can easily make friends with people they meet online.	My child avoids making friends with people they don't know.
If I warn my child to get off the screen before he finishes his game, he gets angry.	My child spends enough time online to meet my needs.
My child never uses technological devices as a teaching material.	My child always uses technological devices as differentiated teaching materials.
According to my child, computers, phones and tablets were invented for children to play games in their free time.	According to my child, computers, phones and tablets were invented to make people's lives easier.
My child uses technological devices in all situations.	My child uses technological devices according to his/her needs.
Setting limits on technological gadgets can drive a wedge between me and my child.	We don't need to set limits on technological devices as my child uses his/her time productively.
No matter how much I warn my child, I will catch them playing secretly.	My child does not use technological devices unless I give permission.
My child prefers playing computer games to playing outside in good weather.	My child takes advantage of good weather to play outside.

When the internet goes out at home, my child behaves uncontrollably and asks us to account for it.	When there is no internet, my child creates alternative games.
My child will never admit that there are harmful aspects of technology.	My child is always aware of the problems that can arise from the misuse of technology.
I don't have time to supervise my child's use of technology.	I constantly monitor my child to see if he/she is using technology correctly.
My child's academic achievement and self-confidence are low because of the time he/she spends on the internet.	My child who uses technology in line with his/her needs has high academic success and self-confidence.
I often can't cope with my child's attachment to technology.	In any case, my child, with whom I have reached a mutual agreement, has no attachment to technology.
His attachment to technology has limited my child's interests and hobbies.	My child, who does not depend on technology, has a wide range of interests and hobbies.

Appendix 1. Technology Use Inventory: Parent Form.

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