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THE VALIDITY AND RELIABILITY STUDIES OF THE SCHOOL ADMINISTRATORS' AND TEACHERS' VIEWS ON EDUCATIONAL TECHNOLOGIES (VOET) SCALE

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Abstract
This study aims to develop a measurement tool that will enable the determination of school administrators' and teachers' opinions on educational technologies. The items prepared by scanning the literature were presented to the opinions of the experts. Following the opinions, the 51-item trial form was applied to a total of 406 administrators and teachers, 249 women and 157 men working in the project high schools in the central and districts of Izmir in the 2018-2019 spring term for pre-application. The results of the factor analysis showed that the scale had four factors explaining 55.64% of the total variance. The last application was performed with a total of 636 administrators and teachers, including 385 women and 251 men, and the construct validity of the measurement tool was reevaluated. Exploratory factor analysis was applied, and it was deemed appropriate to continue the analysis with 37 variables and six factors consisting of these variables. It was determined that the six factors obtained explained 60.17% of the total variance. The determined factors are; "Concerns about educational technologies", "opinions about the contribution of educational technologies to education", "opinions about the concept of educational technologies", "criticisms about educational technologies", "benefits related to the use of educational technologies in educational environments" and "opinions about the scope of educational technologies". As a result of the confirmatory factor analysis performed with the data set, it seems that the ratio of the scale's Chi-square Test ($\chi 2$) to degrees of freedom (X2/df) is 4.1; GFI, .88; CFI, .95; NFI, .95; NNFI, .95; IFI, .95; RMSEA, .08; and SRMR, .05. Considering the suggested values in the literature, it is seen that GFI is slightly below the limit, RMSEA and X^2/df are acceptable, while other fit indices are excellent. Since the fit indexes should be evaluated as a whole, the scale can be said to have a good structure. Cronbach Alpha internal consistency coefficient of the scale whose reliability studies were completed was determined as α=.0.89.

Keywords: Educational technologies, project schools, manager, teacher, validity and reliability.

INTRODUCTION

In recent years, innovation efforts in education have got their return in our country as well as on a universal scale, and the accumulated educational problems have been tried to be overcome. These studies, which aim to change some or all of the education systems, have to provide more qualified education to individuals as well as meet the educational needs of the rapidly increasing population (Kaya, 2002). For this reason, many countries have resorted to several innovations to improve their education systems. These innovations include system-level reforms, efforts to create modern institutions, effective use of educational technologies, and practices to improve the quality of school administrators and teachers (Ozden, 2005). It can be said that one of the elements that these practices focus on, which emerged as a requirement of the changing understanding of education and developing technology, is education technology, and the other is the qualifications of school administrators and teachers. School administrators play an important role in facilitating the use of technology and are one of the keys to the successful implementation of technology in educational settings. When administrators act as technology leaders, teachers, and students accept and use technology more successfully. For this, administrators need to develop a new understanding of

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teaching practices to support teachers' efforts and use technology in the classroom. As educational leaders, administrators create an environment suitable for technology integration. They create new methods to maximize learning and teaching. They strive to include technologies suitable for learning environments in the curriculum. They use technology to increase their productivity and the efficiency of others (Yu and Durrington, 2006). On the other hand, teachers are considered as the most important factors in the school regarding the quality of student success. It is seen that the quality of teachers is the main driver of success in school systems that perform well. Extensive research on factors affecting students' learning outcomes shows that the quality of teachers has a greater impact on students' learning than the quality of the curriculum, teaching methods, school building, or the role (Snoek, 2012).

Stating that it is imperative to give education a scientific and technological quality, Alkan (2011) defined educational technology as "design, implementation, evaluation, and development of learning or teaching processes through the utilization of relevant knowledge and skills to dominate education in general, and learning in particular". Educational technology is the effective use of technological tools in education. Brückner, (2015), on the other hand, emphasizes that education technology is not limited to only advanced technology; but they are effective applications made taking into consideration machines, networks, a set of tools and hardware, as well as theoretical perspectives. E-learning, the modern education technology which is based on information and communication technologies, includes multimedia learning, technology-assisted learning, computer-based education, teaching, computer-assisted education, internet-based education, flexible learning, web-based education, online education, virtual education, personal learning environments, and digital education. It also covers various technological applications such as texts, sounds, images, animations, and streaming videos.

Aim of the research

This research will be the first study to be implemented in project schools. For this reason, the opinions of the administrators and teachers working in these schools, which are claimed to host national and international special projects, and have electronic and information infrastructure facilities that will be at a high level, are quite interesting. The main purpose of this study is to develop a measurement tool to determine the views of school administrators and teachers on educational technologies.

METHOD

Study Group

The validity and reliability analysis of the VOET scale was conducted over a total of 406 administrators and teachers, 249 women, 157 men working in the project high schools in the center and districts of İzmir in the 2018-2019 Spring term for pre-application; and over a total of 636 administrators and teachers, 385 women, 251 men, in the 2018-2019 Fall term for post-application. The criteria proposed by Tabachnick and Fidell (2007) for factor analysis were taken into account in determining the number of the research sample. According to these criteria; 300 people were evaluated as "good", 500 people as "very good" and 1000 people as "excellent" for factor analysis. In this context, 406 administrators and teachers working in 10 schools that are easily accessible among the project high schools were contacted.

Table 1: Project high schools included in the research

District		School's name
1	Konak	Nevvar Salih Isgoren Vocational-Technical Anatolian High School
2	Konak	Cinarli Vocational-Technical Anatolian High School
3	Konak	Sehit Omer Halisdemir Anatolian Religious Vocational High School
4	Guzelbahce	Sehit Abdullah Ucok Anatolian Religious Vocational High School

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5	Guzelbahce	Guzelbahce 60. Yil Anatolian High School
6	Karsiyaka	Cihat Kora Anatolian High School
7	Karsiyaka	15 Temmuz Sehitler Anatolian High School
8	Konak	Izmir Girls High School
9	Urla	Cengiz Aytmatov Social Sciences High School
10	Menemen	Sehit Ahmet Ozsoy Science High School
11	Tire	Ogretmen Melahat Aksoy Social Sciences High School
12	Tire	Belgin Atil Callioglu Science High School
13	Torbali	Anatolian Project High School
14	Konak	Izmir Ataturk High School
15	Bergama	Bergamali Kadri Anadolu Religious Vocational High School
16	Gaziemir	Sehit Mustafa Yaman Anatolian Religious Vocational High School
17	Bergama	Yusuf Kemalettin Perin Anatolian High School
18	Karabaglar	Necmettin Erbakan Anatolian Religious Vocational High School
19	Karabaglar	Hisar Anatolian Religious Vocational High School
20	Karsiyaka	Sehit İlhan Varank Anatolian Religious Vocational High School
21	Bornova	İzmir Science High School
22	Menemen	Sehit Hakan Gülsen Anatolian Religious Vocational High School
23	Odemis	Aydınoglu Mehmet Bey Anatolian Religious Vocational High School
24	Buca	Buca Girls Anatolian Religious Vocational High School
25	Cesme	Ulusoy Maritime Technology Vocational-Technical High School
26	Bornova	Bornova Anatolian High School
27	Cigli	Cigli Science High School

Table 2: Information on the Administrators and Teachers Participating in the Research

Variable	Group	f	%
Position Title	Teacher	562	88,4
	Administrator	74	11,6
	Total	636	100
Gender	Female	385	60,5
	Male	251	39,5
	Total	636	100
Age	22-25	29	4,6
	26-30	89	14,0
	31-35	107	16,8
	36-40	134	21,1
	41- and above	277	43.6
	Total	636	100
Subject Matter	Social Sciences	313	49,2
	Life Sciences	230	36,2
	Vocational Courses	93	14,6

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	Total	636	100
Years of Seniority	1 - 5 years	85	13,4
	6 - 10 years	98	15,4
	11 - 15 years	122	19,2
	16 - 20 years	117	18,4
	21 years and above	214	33,6
	Total	636	100

Information on the position title, gender, age, subject matter and professional years of seniority of the school administrators and teachers participating in the research are shown in table 1. When the table is analyzed, it is seen that 88.4% (f=562) of the participants are teachers and 11.6% (f =74) are administrators. However, it is understood that 60.5% (f = 3855) are women and 39.5% (f = 251) are men. It is seen that the subject matters of 49.2% (f =313) of the participants are Social Sciences, 36.2% (f=230) are Science and 14.6% (f=93) are Vocational Courses. When examined in terms of professional years of seniority, 13.4% (f=85) of the participants have 1-5 years, 15.4% (f=98) have 6-10 years, 19.2% (f=122) have 11–15 years, 18.4% (f=117) have 16-20 years, and 33.6% (f=214) have 21 years of professional seniority.

Preparation of the Data Collection Tool

To develop the VOET Scale, a literature review on the subject was made and a pool of 76 items was created. It was decided that the scale should consist of a 51-item trial form by the evaluation of the expert group of eight experts working in the Education Technologies and Computer and Instructional Technologies Departments of various universities. The trial form was applied to a total of 406 administrators and teachers, 249 women and 157 men, working in the project high schools in Izmir city center and districts in the 2018-2019 Spring term for pre-application. The results of the factor analysis showed that the scale had four factors explaining 55.64% of the total variance. The last application was performed with a total of 636 administrators and teachers, including 385 women and 251 men, and the construct validity of the measurement tool was reevaluated. Exploratory factor analysis was applied, and it was deemed appropriate to continue the analysis with 37 variables and six factors consisting of these variables. It was determined that the six factors obtained explained 60.17% of the total variance. The determined factors are; "Concerns about educational technologies", "opinions about the contribution of educational technologies to education", "opinions about the concept of educational technologies", "criticisms about educational technologies", "benefits related to the use of educational technologies in educational environments" and "opinions about the scope of educational technologies". As a result of the confirmatory factor analysis performed with the data set, it seems that the ratio of the scale's Chi-square Test (χ^2) to degrees of freedom (χ^2/df) is 4.1; GFI, .88; CFI, .95; NFI, .95; NNFI, .95; IFI, .95; RMSEA, .08; and SRMR, .05. Considering the suggested values in the literature, it is seen that GFI is slightly below the limit, RMSEA and X^2/df are acceptable, while other fit indices are excellent. Since the fit indexes should be evaluated as a whole, the scale can be said to have a good structure. Cronbach Alpha internal consistency coefficient of the scale whose reliability studies were completed was determined as α=0.89.

Data Analysis

SPSS software was used in the analysis of the data. To examine the structural validity and factor structure of the VOET scale, explanatory, and then confirmatory factor analysis studies were conducted. While the explanatory factor analysis and item analysis studies of the research were carried out with the SPSS22 package software; the confirmatory factor analysis studies were carried out with the Lisrel software.

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RESULTS

Exploratory Factor Analysis

The analysis of the data with 37 variables regarding 636 observations, which were deemed appropriate for evaluation within the scope of the Determination of the Opinions of School Administrators and Teachers on Educational Technologies Study was made with the SPSS22 statistical analysis program. In the previously-made pilot application, 40 variables suitable for the analysis, and four factors that could best explain the change in these variables were determined. After the Exploratory Factor Analysis, which was re-applied after the last application, Questions 29 and 31 constituted a factor, while Question 24 formed a factor alone in the first analysis performed on 40 variables. These questions, which did not comply with the condition that there must be at least 3 variables in each factor, were removed from the data set. An exploratory factor analysis was applied on the VOET scale consisting of 37 questions, and it was deemed appropriate to continue the analysis with 37 variables and six factors consisting of these variables.

First of all, KMO and Barlett Sphericity Test results were examined to determine whether the data were suitable for factorability If the KMO value was between 0,50-0,60, it was interpreted as bad, if between 0,60 and 0,70, as weak, if between 0,70 and 0,80, as moderate, if between 0,80 and 0,90, as good and if 0,90 and above as excellent (Leech, Barrett and Morgan, 2008; Tavsancil, 2005). The KMO value for the data was found to be significant at 0.917 and the Barlett Sphericity Test at .05 level ($\chi 2$=12475.238; sd=666; p=.000). These findings show that the assumptions of the Factor Analysis were met, that is, the data were suitable for factorability. Three methods are mainly used to decide the number of factors (Tabachncik & Fidell, 2007; Buyukozturk, 2002).

1. Eigenvalue: In factor analysis, initially, the factors whose eigenvalue is greater than or equal to 1 are taken as important factors.
2. Eigen Value Chart: Another method used to decide the number of factors is to study the eigenvalue chart (Scree Plot). In the graph, the vertical axis shows the eigenvalues and the horizontal axis shows the factors. The graph is obtained by combining the points found by matching the factors with their eigenvalues. In the graph, the point where the high acceleration and rapid decreases are experienced is considered as the cutting point and the number of intermediate points up to this point gives information about the possible number of factors. Additionally, horizontal lines indicate that the contributions of the additional variances brought by the factors are close to each other.
3. Explained Variance Rate: Another method that can be used to decide the number of factors is to examine the explained variance rate. The number of factors in which 2/3 of the total variance related to the variables included in the analysis is covered is evaluated as the number of important factors (Buyukozturk, 2016). In this research, these three methods mentioned in deciding the number of factors were taken into consideration. The first exploratory factor analysis results obtained by the principal components analysis method and without any rotation are given in Table 4.

Table 3: VOET Scale Exploratory Factor Analysis Results

Factors	Factor Eigenvalues	Explained Variance (%)	Total Variance (%)
1	9,400	25,405	25,405
2	5,666	15,314	40,719
3	2,501	6,760	47,479
4	2,085	5,634	53,113
5	1,584	4,280	57,393
6	1,028	2,778	60,172

When the factor eigenvalues obtained from the principal components analysis and the variance explained by the factors were examined, it was seen that six factors with eigenvalues above 1 were obtained. The eigenvalue is the sum of the squares of the factor loads of each factor and is a coefficient used in calculating the ratio of the variance explained by each factor and deciding on the number of important factors. As the eigenvalue increases, the variance rate explained by the factor

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also increases (Tabachnick & Fidell, 2007). It is seen that these six factors with eigenvalues greater than 1 explained 60.17% of the variance in total, and the eigenvalues were 9.40 for the first factor, 5.67 for the second factor, 2.50 for the third factor, 2.09 for the fourth factor, 1.58 for the fifth factor and 1.03 for the sixth factor. However, when deciding on the number of factors, only looking at the eigenvalues may fail to obtain meaningful factor structures (Ozdamar, 2004). For this reason, the eigenvalue graph and the explained variance rates, which are used in determining the number of factors, were examined.

Table 4: Distribution of VOET Factor Structures

	Factor Component					
	1	2	3	4	5	6
36- It is difficult for teachers to adapt to technological developments.	0,875					
37- Teachers will find it difficult to follow the developments in educational technology.	0,862					
40- Teachers do not want to change the teaching methods they are used to.	0,826					
35- Associating technology with education is not easy for teachers.	0,816					
39- Teachers do not adopt new technologies due to a lack of training.	0,813					
38- Teachers do not have as many technological skills as students.	0,776					
34- Teachers think that technology will undermine their authority.	0,634					
33- The teaching method that the teacher is used to limits the use of technology.	0,523					
21- Educational technologies take educational services to wider audiences.		0,768				
19- Educational technologies isolate education from the pressure of time and space.		0,756				
22- Educational technologies play a role in increasing the efficiency and productivity of educational staff.		0,695				
20- Using technology in learning environments increases students' interest in the learning environment.		0,649				
17- Educational technologies facilitate individualized learning.		0,629				
18- Educational technologies facilitate access to difficult-to-access resources.		0,622				
23- Educational technologies enable students to meet their lifelong education needs.		0,606				
16- Educational technologies increase the quality of schools.		0,586				
5- Educational technologies are the efficient use of technological resources in education.			0,780			
4- Educational technologies are the field of research that develops teaching and learning environments.			0,763			
6- Educational technologies are the reflection of technological developments in teaching practices.			0,731			

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3- Educational technologies include all kinds of systems, techniques, and support created to improve the teaching and learning process.	0,710			
2- Educational technologies are technological products used in teaching and learning processes.	0,662			
1- Educational technologies are a specialty to achieve the goals of the educational program.	0,635			
27- Educational technologies commercialize education.		0,795		
28- Non-educational institutions direct education using technology.		0,758		
30- Educational technologies are the intervention of global policies to local education.		0,723		
25- Efforts to put technology into classes create far-fetched needs.		0,691		
26- Integrating a poorly functioning education system with technology is a futile effort.		0,639		
32- No matter how far technology goes, it will not lighten the burden of the teacher but increase.		0,573		
14- Educational technologies make it convenient for the teacher to understand the learning tendencies of the student.			0,685	
12- Educational technologies increase the willingness of students to attend classes.			0,679	
13- Applications of educational technologies make learning permanent.			0,665	
15- Educational technologies enable the design of new learning environments.			0,548	
11- Educational technologies enrich learning environments in the teaching-learning process.			0,539	
8- Educational technologies is the branch of science that makes educational needs and possibilities the subject of scientific research.				0,804
7- Educational technologies cover applications for the solution of educational problems.				0,742
9- Educational technologies are the design, implementation, evaluation, and development of teaching and learning processes.				0,719
10- Educational technologies are methods and techniques created to apply teaching principles.				0,664

In line with the results of the Factor Analysis and Reliability Analysis, the Views on Educational Technologies Scale consists of 37 items and 6 sub-factors. The first factor consists of 8 items under the title of Concerns Regarding Educational Technologies, the second factor consists of 8 items under the title of Opinions on the Contribution of Education Technologies to Education, the third factor consists of 6 items under the title of Views on the Concept of Educational Technologies, the fourth factor consists of 6 items under the title of Criticisms on Educational Technologies, the fifth factor consists of 5 items under the title of Benefits of Using Educational Technologies in Educational Settings, and the sixth factor consists of 4 items under the title of Views on the Scope of Educational

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Technologies. The six-factor structure explains 60.17% of the total variance for the concept to be measured and the Cronbach's Alpha internal consistency coefficient is calculated as α=0.89. It is seen that the KMO value of the scale is at an excellent level by 0.917.

The entire content of the Views on Educational Technologies Scale and the Spearman correlation coefficient matrix of each subscale with each other are given in Table 5. A correlation coefficient approaching 1 indicates that there is a strong relationship between the variables, a value between 0.7 and 1 indicates a high relationship, a value between 0.3 and 0.7 indicates a medium relationship, and a value between 0.3 and 0.0 indicates a poor relationship. If the sign of the relationship is negative, it can be said that there is a reverse relationship (Buyukozturk, 2016).

Table 5: Correlation Coefficients Between VOET Sub-Factors

		Total	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Total VOET	Spearman Correlation	1,000						
Factor 1	Spearman Correlation	0,491	1,000					
Factor 2	Spearman Correlation	0,630	-0,019	1,000				
Factor 3	Spearman Correlation	0,537	-0,059	0,490	1,000			
Factor 4	Spearman Correlation	0,345	0,372	-0,194	-0,134	1,000		
Factor 5	Spearman Correlation	0,625	-0,040	0,746	0,499	-0,220	1,000	
Factor 6	Spearman Correlation	0,624	-0,047	0,485	0,478	-0,072	0,535	1,000

Confirmatory Factor Analysis of VOET Scale

450 people were randomly selected from the data collected for confirmatory factor analysis regarding the views of school administrators and teachers on the educational technology scale. Before the analysis, the data were reviewed, extreme value analysis was performed, 16 individuals determined to be extreme values were excluded from the analysis. Whether the data was normally distributed was checked and it was determined that the data was within the normal range. The first confirmatory factor analysis on the scale of views of school administrators and teachers on educational technologies was carried out, but it was found that the goodness of fit values was slightly below the expected. As a result, an error covariance was made between item 5 and item 6, and item 39 and item 40. As a result of the corrections made, the results of the Confirmatory Factor Analysis Goodness of Fit Indices regarding the views of school administrators and teachers on educational technology scale (VOET) are presented in table 6. When the table is examined, the ratio of the scale's Chi-square Test (χ2) to degrees of freedom (X2/df) is 4.1; GFI, .88; CFI, .95; NFI, .95; NNFI, .95; IFI, .95; RMSEA, .08; and SRMR, .05. Considering the suggested values in the literature, it is seen that GFI is slightly below the limit, RMSEA and X^2/df are acceptable, while other fit indices are excellent. Since the fit indexes should be evaluated as a whole, the scale can be said to have a good structure (Hu and Bentler, 1999; Kline, 2005; Schreiber, Nora, Stage, Barlow, and King, 2006).

Table 6: Goodness of Fit Indices of the Confirmatory Factor Analysis on the VOET Scale

Fit indices	Current value	Excellent value	Acceptable value
X^2 /df	2559/ 612: **4,1**	$0 \leq x^2/sd \leq 2$	$2 \leq x^2/sd \leq 5$
CFI	0.95	.95 ≤ CFI ≤ 1.00	.90 ≤ CFI ≤ .95
NFI	0.95	.95 ≤ TLI ≤ 1.00	.90 ≤ TLI ≤ .95

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NNFI	0.95	.95 ≤ NNFI ≤ 1.00	.90 ≤ NNFI ≤ .95
IFI	0.95	.95 ≤ IFI ≤ 1.01	.90 ≤ IFI ≤ .96
RMSEA	0.08	.00 ≤ RMSEA ≤ .05	.05 ≤ RMSEA ≤ .10
SRMR	0.05	.00 ≤ SRMR ≤ .05	.05 ≤ SRMR ≤ .10
GFI	**0.88**	.95 ≤ GFI ≤ 1.00	.90 ≤ GFI ≤ .95

The factor loads of the items are expected to be between the recommended values to show that the VOET Scale has a healthy structure. It is stated in the literature that the factor loads of the sub-dimensions should be .50 and above for convergent validity (Peterson, 2000). The factor loads, standard errors, and t values of the items of the scale are given in table 7. When Table 7 was examined, it was found that the items in the scale showed a significant relationship with the general structure. It was determined that although item 1, included in the sub-dimension of concerns regarding educational technologies, was at the border, it was compatible with the general structure. Considering the factor loads of other items in the scale, it can be said that the scale constitutes evidence of convergence validity.

Table 7: Results Regarding VOET Scale Items and Factor Loads

Factors	Items	Std. Factor loads	sh	t values	p
Concerns about educational technologies					
	E33	0.49	0.05	10.3	< .001
	E34	0.63	0.05	12.9	< .001
	E35	0.89	0.04	21.0	< .001
	E36	0.95	0.04	24.5	< .001
	E37	0.94	0.04	24.7	< .001
	E38	0.78	0.05	18.1	< .001
	E39	0.73	0.05	17.9	< .001
	E40	0.73	0.04	17.5	< .001
Opinions about the contribution of Educational Technologies to education					
	E16	0.80	0.03	17.5	< .001
	E17	0.77	0.03	16.6	< .001
	E18	0.76	0.02	15.3	< .001
	E19	0.81	0.03	17.9	< .001
	E20	0.82	0.02	17.4	< .001
	E21	0.78	0.03	16.5	< .001
	E22	0.79	0.03	16.0	< .001
	E23	0.66	0.03	13.9	< .001
Opinions about the concept of educational technologies					
	E1	0.74	0.03	13.2	< .001
	E2	0.80	0.02	16.0	< .001
	E3	0.82	0.03	17.4	< .001
	E4	0.90	0.02	20.3	< .001
	E5	0.87	0.02	21.1	< .001
	E6	0.82	0.02	19.4	< .001
Criticism of educational technologies					
	E25	0.68	0.05	14.5	< .001
	E26	0.63	0.06	12.4	< .001
	E27	0.86	0.05	19.1	< .001
	E28	0.74	0.04	15.6	< .001

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	E30	0.71	0.05	15.9	< .001
	E32	0.64	0.05	13.3	< .001
Benefits of using educational technologies in educational environments					
	E11	0.77	0.02	15.2	< .001
	E12	0.84	0.03	18.0	< .001
	E13	0.84	0.03	18.7	< .001
	E14	0.83	0.03	18.3	< .001
	E15	0.81	0.02	17.1	< .001
Views on the scope of educational technologies					
	E7	0.75	0.04	15.1	< .001
	E8	0.84	0.03	17.7	< .001
	E9	0.82	0.03	17.1	< .001
	E10	0.81	0.03	17.1	< .001

Cronbach Alfa internal consistency coefficient and McDonald omega were calculated for reliability analysis of the VOET Scale. The reliability coefficients for the whole and sub-dimensions of the scale are presented in table 8 below. The total Cronbach Alpha value for the VOET Scale was .89 and McDonald omega .90. The Cronbach Alpha value and McDonald omega of the sub-dimensions of opinions about the concept of educational technologies, opinions about the scope of the educational technologies, Benefits of using educational technologies in educational environments, opinions about the contributions of educational technologies to education, criticisms of educational technologies, concerns about educational technologies were calculated as .89 and .89; .83 and .83; .86 and .87; .89 and .89; .83 and .84; .91 and .91, respectively. A reliability value greater than .70 in all dimensions and in total means a very good value (Nunnully and Bernstein, 1994) As can be seen in Table 8, the reliability of the scale can be said to be quite high.

Table 8: Averages, Standard Deviations, Item Total Correlations and Reliability Analysis Results Regarding the VOET Scale

Factors and items	$\bar{X}$	Ss	Item total r	Item McDonald ω	Item Cronbach α	Factor McDonald ω	Factor Cronbach α
Opinions about the concept of educational technologies						0.887	0.884
E1	4.346	0.771	0.559	0.887	0.886		
E2	4.360	0.669	0.654	0.874	0.871		
E3	4.330	0.721	0.693	0.869	0.865		
E4	4.280	0.714	0.763	0.857	0.853		
E5	4.353	0.694	0.784	0.852	0.850		
E6	4.337	0.707	0.726	0.862	0.859		
Views on the scope of educational technologies						0.832	0.831
E7	3.791	0.994	0.626	0.803	0.803		
E8	3.998	0.870	0.719	0.764	0.761		
E9	4.167	0.728	0.638	0.797	0.794		
E10	4.050	0.826	0.649	0.794	0.788		
Benefits of using educational technologies in educational environments						0.865	0.864
E11	4.456	0.672	0.609	0.855	0.854		
E12	4.271	0.805	0.733	0.826	0.824		
E13	4.181	0.837	0.710	0.831	0.830		
E14	4.289	0.736	0.726	0.827	0.826		
E15	4.360	0.675	0.653	0.846	0.843		
Opinions about the contribution of Educational Technologies to education						0.888	0.887

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E16	4.337	0.763	0.674	0.872	0.872		
E17	4.197	0.809	0.662	0.874	0.873		
E18	4.445	0.657	0.620	0.877	0.877		
E19	4.291	0.773	0.695	0.870	0.869		
E20	4.305	0.709	0.677	0.872	0.871		
E21	4.369	0.704	0.673	0.872	0.872		
E22	4.174	0.786	0.693	0.872	0.870		
E23	4.032	0.860	0.570	0.882	0.882		
Criticism of educational technologies						0.836	0.834
E25	3.067	1.179	0.602	0.813	0.809		
E26	3.321	1.350	0.536	0.824	0.822		
E27	3.055	1.223	0.731	0.783	0.781		
E28	3.280	1.104	0.620	0.806	0.804		
E30	3.101	1.120	0.612	0.809	0.805		
E32	3.069	1.281	0.536	0.824	0.821		
Concerns about educational technologies						0.914	0.910
E33	3.353	1.148	0.472	0.920	0.918		
E34	2.399	1.181	0.557	0.915	0.911		
E35	2.640	1.202	0.771	0.898	0.893		
E36	2.612	1.178	0.834	0.891	0.887		
E37	2.633	1.178	0.821	0.893	0.888		
E38	2.947	1.306	0.731	0.901	0.896		
E39	2.610	1.196	0.743	0.901	0.895		
E40	2.741	1.182	0.756	0.900	0.894		
Scale Total						0.901	0.888

According to the available data, the path diagram and factor loads resulting from the CFA related to VOET Scale are given in Figure 1.

DISCUSSION AND CONCLUSION

In this study, a scale consisting of a total of 37 items with a six-factor structure was developed to determine the opinions of school administrators and teachers regarding educational technologies.
A pool of 81 items was created by following the scale development stages. As a result of the evaluations of the field experts and a teacher group, it was decided to include 51 items on the test scale. The trial form, which was prepared as a preliminary application, was applied to 406 administrators and teachers working in 10 out of 27 project high schools in İzmir and its districts. First, exploratory factor analysis was performed on the data obtained, items with a factor load below 0.45, a total correlation below .30, and with negative values were eliminated (Buyukozturk, 2013: 183). As a result of the analyzes, a structure with 40 items and 4 factors was obtained. Cronbach Alpha internal consistency coefficient was found to be 0.88, and the internal consistency coefficients obtained from sub-factors were determined as .94, .89, .84, .90, respectively. In the pre-application, 40 variables suitable for the analysis, and four factors that can best explain the change in these variables were determined. However, after the Exploratory Factor Analysis, which was applied again as a result of the last application, in the first analysis made over 40 questions, the 29th and 31st questions constituted one factor, while the 24th question alone constituted a single factor. These questions, which did not comply with the condition that there must be at least 3 variables in each factor, were removed from the data set. Exploratory Factor Analysis was applied on the 37-Question VOET scale, and analysis was continued with 37 variables and a six-factor structure consisting of these variables. The Cronbach Alpha internal consistency coefficient was 0.89, and the internal

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consistency coefficients obtained from sub-factors were found as .88, .83, .86, .88, .83, .91, respectively. A confirmatory factor analysis was applied to the six-factor model with 37 items and the ratio of the values (χ2) to the degrees of freedom of the model (X2/df) was 4.1; GFI, .88; CFI, .95; NFI, .95; NNFI, .95; IFI, .95; RMSEA, .08; and SRMR, .05. The fit indices of the obtained values were accepted based on the references. As a result, the scale took its final form with its 37-item and six-factor structure.

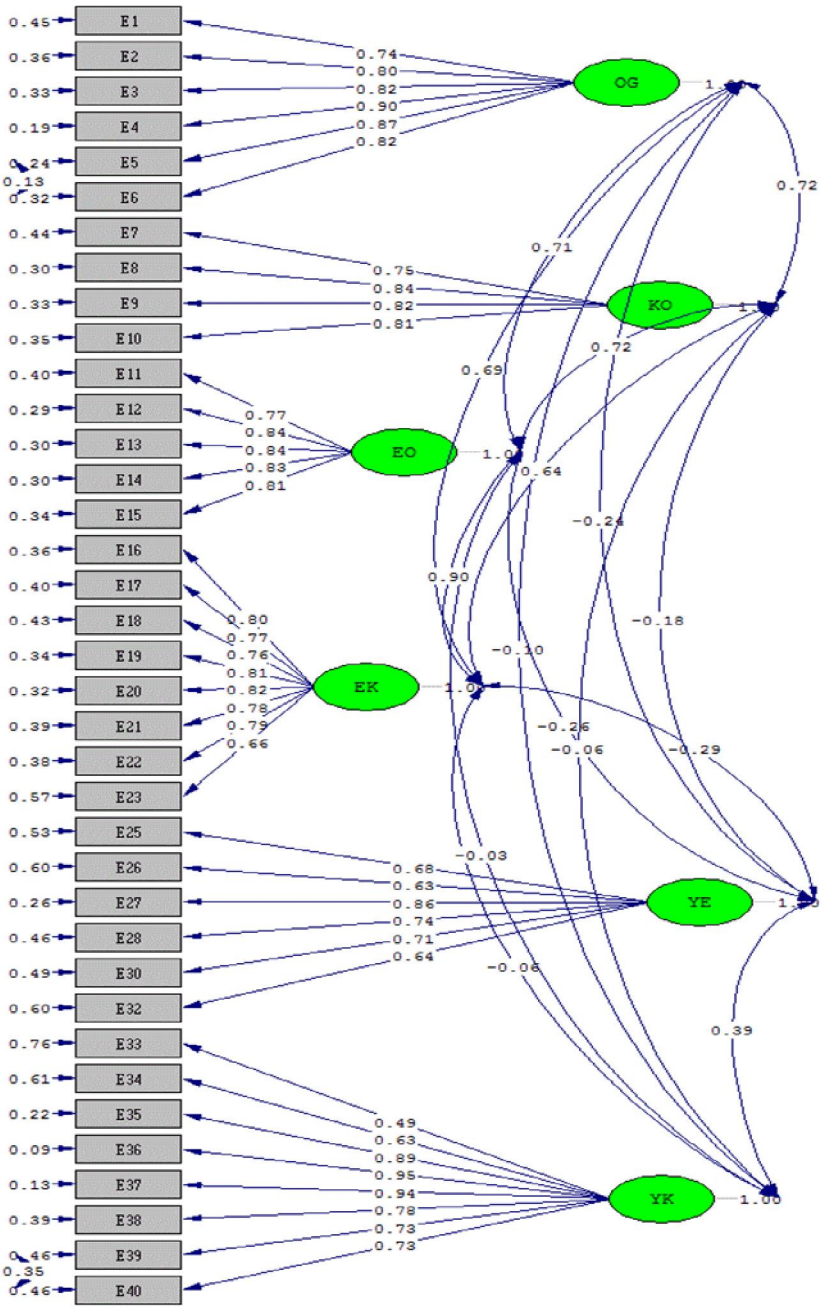

Figure 1: Confirmatory Factor Analysis Path Chart

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The approach of school administrators and teachers to educational technologies and their views on them have gained importance and affected the skills of students in different directions. Views and behaviors of school administrators and teachers about educational technology can change students' perspectives and behaviors towards technology. For this reason, a measurement tool has been developed to investigate the practices and opinions of the teaching staff in order to understand, develop educational processes, and offer new solutions. It is thought that this study will contribute to the literature in this direction.

Note: Produced from unpublished PhD thesis.

REFERENCES

Alkan, C. (2011). Eğitim Teknolojisi. Anı Yayıncılık. 8. Baskı. Ankara.

Brückner, M. Educational Technology Related articles from the Wikipedia (Feb. 14, 2015).

Büyüköztürk, Ş. (2002). *Sosyal bilimler için veri ve analizi el kitabı: istatistik, araştırma deseni, SPSS uygulamaları ve yorum*. Pegem A Yayıncılık.

Büyüköztürk, Ş. (2016). *Sosyal bilimler için veri analizi el kitabı.* Ankara: Pegem Akademi Yayıncılık. Geliştirilmiş 22. Baskı.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structural analysis: Conventional criteria versus new alternatives. Structural Equation Modeling, 6, 1–55.

Kaya, Z. (2002). Uzaktan Eğitim. Ankara: Pegem A Yayınları.

Kline, R. B. (2005). Principles and practice of structural equation modeling. New York: Guilford.

Leech, N. L., Barrett, K. C., & Morgan, G. A. (2008).SPSS for intermediate Statistics: Use and interpretation. New York, NY: Routledge.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGrawHill.

Özdamar, K. (2004). Paket programlar ile istatistiksel veri analizi (çok değişkenli analizler). *Kaan Kitabevi, Eskişehir*.

Özden, Y.(2005). Eğitimde yeni değerler. Ankara. Pegem A yayıncılık.

Peterson, R. (2000). A meta-analysis of variance accounted for and factor loadings in exploratory factor analysis. *Marketing Letters*, 11, 261–275.

Schreiber, J. B., Nora, A., Stage, F. K., Barlow, E. A., & King, J. (2006). Reporting structural equation modeling and confirmatory factor analysis results: A review. The Journal of educational research, 99(6), 323-338.

Snoek, M. (2012). Theories on and concepts of professionalism of teachers and their consequences for the curriculum in teacher education. *Hogeschool van Amsterdam, The Netherlands*.

Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2007). *Using multivariate statistics* (Vol. 5). Boston, MA: Pearson.

Tavşancıl, E. (2005). Tutumların ölçülmesi ve SPSS ile veri analizi (2. bs). *Ankara: Nobel Yayınları*.

Copyright © International Journal on New Trends in Education and Their Implications / www.ijonte.org

Yu, C., & Durrington, V. A. (2006). Technology Standards for School Administrators: An Analysis of Practicing and Aspiring Administrators' Perceived Ability to Perform the Standards.

APPENDIX: The Measurement Tool

Dear Teacher;
This study aimed to "determine the Views of School Administrators and Teachers on Educational Technologies. This information to be obtained from you will be used only as research data and will be kept confidential. Therefore, you do not need to write your clear identity in the questionnaire. Thank you for your interest and contributions.

Metin ARPA
Gazi University Institute of Educational Sciences
Education Technologies Ph.D. student

Your gender **Female ( )** **Male ( )**	**Your subject matter** **Social Sciences ( )** **Life Sciences ( )** **Vocational Classes ( )**
Your age **1. 22-25 ( )** **2. 26-30 ( )** **3. 31-35 ( )** **4. 36-40 ( )** **5. 41- and above ( )**	**Your Years of Seniority** **1 - 5 years ( )** **6 - 10 years ( )** **11 - 15 years ( )** **16 - 20 years ( )** **21 years and above ( )**
Your Position Title **Teacher ( )**	**Administrator ( )**

Opinions Scale on Educational Technologies

	OPINIONS / ITEMS	5- Strongly agree	4- Agree	3-Neutral	2-Disagree	1-Strongly disagree
1	Educational technologies are a specialty to achieve the educational program.	5	4	3	2	1
2	Educational technologies are technological products used in teaching and learning processes.	5	4	3	2	1
3	Educational technologies include all kinds of systems, techniques, and support created to improve the teaching and learning process.	5	4	3	2	1

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4	Educational technologies is the field of research that develops teaching and learning environments.	5	4	3	2	1
5	Educational technologies are the efficient use of technological resources in education.	5	4	3	2	1
6	Educational technologies are the reflection of technological developments in teaching practices.	5	4	3	2	1
7	Educational technologies cover applications for the solution of educational problems.	5	4	3	2	1
8	Educational technologies are the branch of science that makes educational needs and possibilities the subject of scientific research.	5	4	3	2	1
9	Educational technologies are the design, implementation, evaluation, and development of teaching and learning processes.	5	4	3	2	1
10	Educational technologies are the methods and techniques created to apply teaching principles.	5	4	3	2	1
11	Educational technologies enrich learning environments in the teaching-learning process.	5	4	3	2	1
12	Educational technologies increase the willingness of students to attend classes.	5	4	3	2	1
13	Applications of educational technologies make learning permanent.	5	4	3	2	1
14	Educational technologies make it convenient for the teacher to understand the learning tendencies of the student.	5	4	3	2	1
15	Educational technologies enable the design of new learning environments.	5	4	3	2	1
16	Educational technologies increase the quality of schools.	5	4	3	2	1
17	Educational technologies facilitate individualized learning.	5	4	3	2	1
18	Educational technologies facilitate access to difficult-to-access resources.	5	4	3	2	1
19	Educational technologies isolate education from the pressure of time and space.	5	4	3	2	1
20	Using technology in learning environments increases students' interest in the learning environment.	5	4	3	2	1
21	Educational technologies take educational services to wider audiences.	5	4	3	2	1
22	Educational technologies play a role in increasing the efficiency and productivity of educational staff.	5	4	3	2	1
23	Educational technologies enable students to meet their lifelong education needs.	5	4	3	2	1
24	Efforts to put technology into classes create far-fetched needs.	5	4	3	2	1
25	Integrating a poorly functioning education system with technology is a futile effort.	5	4	3	2	1
26	Educational technologies commercialize education.	5	4	3	2	1
27	Non-educational institutions direct education using technology.	5	4	3	2	1

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28	Educational technologies are the intervention of global policies to local education.	5	4	3	2	1
29	No matter how far technology goes, it will not lighten the burden of the teacher but increase.	5	4	3	2	1
30	The teaching method that the teacher is used to limits the use of technology.	5	4	3	2	1
31	Teachers think that technology will undermine their authority.	5	4	3	2	1
32	Associating technology with education is not easy for teachers.	5	4	3	2	1
33	It is difficult for teachers to adapt to technological developments.	5	4	3	2	1
34	Teachers will find it difficult to follow the developments in educational technology.	5	4	3	2	1
35	Teachers do not have as many technological skills as students.	5	4	3	2	1
36	Teachers do not adopt new technologies due to a lack of training.	5	4	3	2	1
37	Teachers do not want to change the teaching methods they are used to.	5	4	3	2	1

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