PERCEPTIONS OF TEACHERS ABOUT THE USE OF EDUCATIONAL TECHNOLOGIES IN THE PROCESS OF INSTRUCTION

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Abstract - *Technological developments have been adapted to education. Advanced educational equipments have been integrated into the education and these equipments have always been used by the teachers in the classroom. The purpose of this study is to determine the positive and negative effects of the technological equipments on teachers. The participants of the study consisted of randomly selected 1014 primary and secondary teachers from state and private school (Female: 525, Male: 489) in Istanbul. The data was collected by "Teachers Perception Scale of Educational Technology" developed by researcher including 27 questions. The data was analyzed by using a statistical packet program. According to research results, the applications of educational technology of the teachers during academic year, is very effective in education and it is believed that this should be developed intensively.*

Key words: *teacher, instruction, education, educational technology, perception.*

Introduction

Teaching profession is considered as an artisanship. It starts with gaining the professional knowledge and, then, develops with gaining experience and adapting to standards of teaching at certain levels. Also, technology takes an important place in teaching profession due to its significant effect on teaching and learning process.

The purpose of technology is to increase the quality of life. It emerges with the problems and difficulties people encounter. Technology produces knowledge, tools and processes to solve these problems (Başer, 2006, p.279).

Education expresses mental, emotional and social impacts of all the objects, institutions and individuals excluding himself/herself within the environment where an individual belongs to. (Şişman, 2004, p.3.). Dealing with education as a subject to research, developing its scope and method above the concrete boundaries and aims of science against the latest scientific and technological developments and increasing demands of education is in the agenda of the perception of contemporary education. (Alkan, Kavcar, Sever, 1998).

Educational technology is the act of systematically transforming scientific knowledge into application (Fidan, 1986, p.179). Educational technology includes planning, designing, developing and implementing learning-teaching processes (Alkan, 1997, p.14).

The impact of technology on learning has been well investigated. Kozma (1994) conducted a study to understand whether technology affects learning and the characteristics, operations and status of media that provides effective learning for the students. It was found that technology is an important element for an effective learning (Yanpar, 2008, p.193).

Use of technology in education provides better learning and fosters critical thinking. Different means used in educational technology also provides better learning experience for children (Ismajli, 2008).

"If education is considered as communication among teacher, student and environment, educational technology provides important means for this relationship" (Engler, 1972, p.62).

Computers successfully provide effective learning in science and technology education. Effective learning with technology includes principles that may require new teaching environments (Akbıyık and Şimşek, 2009). Technological tools and instruments that have been used in education so far brought new methods in learning and teaching and required the use of time efficiently. Rapid advancements in science and technology make technological devices and tools useless in a short time. Technology, when used appropriately, is, no doubt, one of the most significant means of training qualified teachers.

No study was found on whether technological infrastructures of the schools in our country have been used according to certain standards aligned with the technological developments. This study investigates to what extend teachers benefit from educational technologies in teaching process and condition of the technological infrastructure in schools.

Aim of the Researcher

This research was conducted to investigate the negative impacts of educational technology on primary and secondary education teachers during educational process, its effect on learning process and use and development of technology and to what extend they use it. Hence, the following questions were answered: Are there significant differences in teachers' perceptions of educational technologies by their teaching subject, experience, the schools where they work, their education, faculties they graduated from and gender?

Significance of the Research

In these days, visualization becomes more and more important in learning process. This study is significant because the results will determine teachers' perception of multi learning environment and inform practitioner on how technology can be effective. This study provides precautions for teacher candidates to acquire positive conception about educational technologies and their application of the technologies.

Limitations

This research is limited to teachers in private and public primary and secondary schools in Istanbul and the data was collected in 2008-2009 academic year using "The Scale of Educational Technology Perception of Teachers".

METHOD

Design of the Research

In order to determine primary school teachers' perception of educational technologies, descriptive survey method is used.

Population and Samples

The population (universe) of the research is consisted of the teachers in public and private schools in Istanbul. Randomly selected 1014 (525 women and 489 men) teachers form the sampling of the research.

The demographic features of the participants illustrated in Table 1. As it is also seen in the table, 25,5 % of the participants have 25 years of experience while 6,6 % have more than 25 years of experience. However, 6,6 % of the group did not state any years of experience.

Table1. Demographic Features of the Participants

GENDER		f	%
		525	51,77
		489	48,22
Total		1014	100
SENIORITY			
	0-5 YEAR	258	25,4
	5-15 YEAR	413	40,6
	15-25 YEAR	191	18,8
	25 YEAR and above	67	6,6
	Lost	87	8,6
INSTITUTION			
	PRIMARY EDUCATION	300	29,5
	SECONDARY EDUCATION	563	55,4
	PRIVATE SCHOOL	136	13,4
LEVEL OF EDUCATION			
	ASSOCIATE DEGREE	36	3,5
	UNDERGRADUATE	823	81
	MASTER	142	14
	DOCTORATE	12	1,2
GRADUATION			
	EDUCATIONAL FACULTY	487	47,9
	SCIENCE AND ART FACULTY	386	38
	OTHER	137	13,5
	Lost Value	6	0,6

Data Collection Tool

In this research a 27-item questionnaire was used data on teachers' age, gender, marital status, institution where employed, department of graduation, level of education and their usage level of technological equipments in the process of education. To test structural validity, descriptive factor analysis was conducted through Principal Component Analysis method. In order to test the the size of sampling and distribution structure for factor analysis process, KMO and Barlett's tests were used. The results of the tests confirmed that the data (KMO=883, Barlett$_{210}$= 4182,119, sig.= 0,000) was consistent with factor analysis. Factor structures which were determined with Varimax rotation method were obtained. 7 items (1, 3, 4, 5, 6, 22, 25) were removed from the

scale as they were found either irrelevant with scale sizes or loaded with more than one factor. In the structural validity analysis, the impact of questions number 10, 12, 13, 14, 16, 18, 21, 23 in the first dimension on Technology's effect on learning process (TELP), negative effects of technology (NET) of questions number 7, 9, 11, 15, 19, 20, 24 in the second dimension and questions number 2, 8, 17, 26, 27 in the third dimension were observed to be at the dimension of using and developing technology (UDT). These three factors are seen to have explained the relationship between technology and education 41,787 %. Internal consistency co efficiency of the scale as regard to the lower sizes are monitored as 0,78 for TELP size, 0,53 for NET and 0,70 for UDT

Table 2. Factors of Educational Technology Perception of Teachers, Stated Variance, Value, Alpha Co efficiency.

	Factor I	Factor II	Factor III
	TELP	NET	UDT
QUESTION16	.721		
QUESTION12	.642		
QUESTION21	.625		
QUESTION18	.592		
QUESTION14	.585		
QUESTION13	.573		
QUESTION10	.520		
QUESTION23	.377		
QUESTION9		.669	
QUESTION20		.668	
QUESTION11		.618	
QUESTION24		-.600	
QUESTION19		.576	
QUESTION15		.515	
QUESTION7		.399	
QUESTION27			.729
QUESTION2			.710
QUESTION8			.467
QUESTION26			.442
QUESTION17			.429
Stated Variance %	25.27	9.82	6.68
Value	5.30	2.06	1.40
Inner Consistency Co efficiency	0.78	0.53	0.70

Findings

Teachers, in general, are seen to have above average perspective of technology in terms of TELP, NET and UDT dimensions. The descriptive statistics regarding the three dimensions are illustrated in Table 3.

The average of teachers' perception of educational technology by their teaching subject is tested at the level of $\alpha=0,05$ through variance analysis method. According to test results, only in NET dimension significant difference is seen. Tukey HSD posthoc analysis was carried out to detect as to which branch of teachers have differences. According to Posthoc analysis result Social Sciences (Average: 23,88; sd:4,32), and Science and Math (Aver-

Table 3. Descriptive Statistics regarding Teachers' Perspective of Educational Technologies

	n	Minimum	Maximum	Average	SD
TELP	1016	8.00	40.00	31.3907	5.43641
NET	1016	11.00	35.00	24.5236	4.18082
UDT	1016	6.00	25.00	17.2313	3.43506

Table 4. Descriptive Statistics and ANOVA results related to Teachers' perspective of Educational Technology in regard to their Branches

		N	Average	SD	$F_{4;900}$	Sig.
TELP	Social Sciences	297	30.67	5.470	1.916	.106
	Science and Math	354	31.29	5.435		
	Language	78	30.96	5.671		
	Art-sport	63	30.92	6.099		
	Primary School Teaching	113	32.29	5.004		
NET	Social Sciences	297	23.88	4.316	4.564	.001
	Science and Math	354	24.36	4.277		
	Language	78	24.96	3.939		
	Art-sport	63	24.22	3.790		
	Primary School Teaching	113	25.76	3.681		
UDT	Social Sciences	297	16.89	3.366	0.648	.629
	Science and Math	354	17.28	3.471		
	Language	78	17.38	3.438		
	Art-sport	63	17.09	3.171		
	Primary School Teaching	113	17.15	3.529		

age:24,36; sd:4,28) teachers are detected to differentiate significantly from Primary School teachers (Average:25,76; sd:3,68) in terms of the Negative Effects of Technology. Test results are seen in Table 4.

Whether there is a significant difference in teachers' perspective of educational technology as regard to their experiences is tested at the level of α=0,05 through variance analysis method. According to the test results, no significant difference at the level of 0.05 was detected at the any point of the scale. The descriptive statistics of the groups and the results of variance analysis were illustrated in Table 5.

Whether there is a significant difference in teachers' perspective of educational technology as regard to the institutions they are employed in is tested at the level of α=0,05 through variance analysis method. A significant difference was seen at the level of 0,005 among the groups in UDT dimension of the results of the scale. Tukey HSD posthoc analysis was carried out to determine the difference between groups. According to Posthoc analysis result a significant difference was detected in UDT dimension between Private School Teachers (Average:18,,61; ss:3,54) and public schools (Average:16,82; sd:3,31; Average:17,26; sd:3,49) teachers. The test results are illustrated in Table 6.

Whether there is a significant difference in teachers' perspective of educational technology with regard to their level of education is tested at the level of α=0,05 through variance analysis method. According to the test results, a

Table 5. Descriptive Statistics and ANOVA results related to teachers' perspective of educational technology as regard to their experiences

		N	Average	SD	$F_{3;925}$	Sig.
TELP	0-5 YEAR	258	31.53	5.19	1.468	.222
	5-15 YEAR	413	31.48	5.22		
	15-25 YEAR	191	30.71	5.69		
	25 YEAR and Above	67	30.59	6.25		
NET	0-5 YEAR	258	24.44	4.24	.734	.532
	5-15 YEAR	413	24.66	3.94		
	15-25 YEAR	191	24.12	4.53		
	25 YEAR and Above	67	24.37	4.36		
UDT	0-5 YEAR	258	17.37	3.34	.823	.481
	5-15 YEAR	413	17.12	3.52		
	15-25 YEAR	191	17.15	3.12		
	25 YEAR and Above	67	17.74	3.76		

Table 6. Descriptive Statistics and ANOVA results related to teachers' perspective of educational technology as regard to the institution they are employed in

		N	Average	SD	$F_{2;996}$	Sig.
TELP	Primary Education	300	31.83	5.46	2.711	.067
	Secondary Education	563	31.56	5.31		
	Private Primary Education	136	30.37	5.81		
NET	Primary Education	300	24.58	4.31	2.312	.100
	Secondary Education	563	24.64	4.00		
	Private Primary Education	136	23.80	4.56		
UDT	Primary Education	300	17.26	3.49	15.125	.000
	Secondary Education	563	16.82	3.31		
	Private Primary Education	136	18.61	3.54		

meaningful difference was seen among the groups at the level of 0,05 in TELP dimension of the scale. Tukey HSD Posthoc analysis was applied to detect the origin of the difference. According to Posthoc analysis result, the teachers who have undergraduation degree (Average:31,25; sd:5,38) differed significantly from those who have master's degree (Average:32,53; sd:5,54) in TELP dimension. The results are illustrated in Table 7.

Whether there is a significant difference in teachers' perspective of educational technology as regard to the faculties they graduated from is tested at the

Table 7. Descriptive Statistics and ANOVA results related to teachers' perspective of educational technology as regard to their level of education

		N	Average	SD	$F_{3;1009}$	Sig.
TELP	Associate Degree	36	30.50	5.65	3.137	.025
	Under Graduation	823	31.25	5.38		
	Master	142	32.53	5.54		
	Doctorate	12	29.41	5.75		
NET	Associate Degree	36	24.86	4.15	1.356	.255
	Under Graduation	823	24.53	4.17		
	Master	142	24.56	4.16		
	Doctorate	12	22.16	4.76		
UDT	Associate Degree	36	17.66	2.56	1.145	.330
	Under Graduation	823	17.13	3.40		
	Master	142	17.63	3.72		
	Doctorate	12	17.66	3.96		

Table 8. Descriptive Statistics and ANOVA results related to teachers' perspective of educational technology as regard to the faculties they graduated from

		N	Average	SD	$F_{2;1007}$	Sig.
TELP	Faculty Of Education	487	31.45	5.34	0.170	0.844
	Faculty Of Science And Art	386	31.24	5.51		
	Other	137	31.40	5.43		
NET	Faculty Of Education	487	24.91	4.07	4.791	0.008
	Faculty Of Science And Art	386	24.04	4.34		
	Other	137	24.43	3.96		
UDT	Faculty Of Education	487	17.18	3.43	0.086	0.918
	Faculty Of Science And Art	386	17.22	3.40		
	Other	137	17.32	3.50		

Table 9. Descriptive Statistics and ANOVA results related to teachers' perspective of educational technology as regard to their gender

	GENDER	n	Average	SD	sd	t	Sig.
TELP	Women	525	31.66	5.20	988	1.641	0.101
	Men	489	31.10	5.66			
NET	Women	525	24.67	4.03	933	1.089	0.276
	Men	489	24.38	4.31			
UDT	Women	525	17.12	3.31	992	1.055	0.292
	Men	489	17.35	3.55			

level of α=0,05 through variance analysis method. According to test results a meaningful difference was seen at the level of 0.05 among the groups in the NET dimension of the scale. In order to detect the origin of the difference, Tukey HSD Posthoc analysis was conducted. According to Posthoc analysis result Education Faculty Graduates (Average: 24,91; sd:4,07) differed significantly from those of Science and Art Faculty (Average:24,04,29; sd:4,34) in regard to the dimensions of the Negative Effects of Technology. Descriptive statistics of the groups and the results of variance analysis are illustrated in Table 8.

To test whether there is a significant difference in teachers' perspective of educational technology as regard to their gender, t test was applied to independent groups. According to the test results no significant difference at α=0,05 level was seen in terms of gender in any dimension of the scale. The findings were illustrated in Table 9.

Conclusion and Suggestions

Conclusion

This study was conducted to determine the results whether there are differences of the opinions of teachers on the use of technology in education and their attitude towards educational tools.

A significant difference was not detected among teachers by their experience. The fact that there is no difference between a new teacher and a teacher with 10 years of experience demonstrates the importance of technology. Scientific and technological advancements develop various innovative educational applications. Hence, within this scope, the use of technology in the schools with active learning environment is becoming more common. Once the teacher and the topic to be taught are designated, physical environments where there are equipments for an effective and productive education come in prominence.

There is a significant difference in teachers' perspective of educational technology with regard to the institutions they are employed in. Private school teachers differed significantly from the those of public institutions in UDT dimension. Teachers are seen to have comprehended the importance of technology and are eager to develop it. The low share allocated to education from the national economy and poor technological infrastructure in public schools comparing to those of private are the main reasons

Significant difference among teachers by their education level in TELP illustrates that the more they conduct Master and Doctorate studies, the greater their perceptions of technology alter and the importance of technology in education can be perceived better. Owing to the fact that Master course and Doctoral studies require research and seminar works more, technology is exceptionally important in educational process.

Technological perception of the teachers who graduated from the Faculty of Education is seen to be more than those from the other faculties. It indicates that, the teachers graduated from the Faculty of Education dealt more with the technology during their education.

Technology perception of female and male teachers is almost the same. There is no contradiction between gender and technology. This indicates that gender does not have any negative impact in the perception of educational technology.

Another fact is that the technology apprehension of Elementary Education teachers is high comparing to others who teache in social sciences. Science, Turkish and Social Sciences elementary education teachers and Primary school teachers know the importance of using equipments in education. Television and video, which are available in Primary Schools and Elementary Education Schools, are used by Primary school teachers more than the Elementary education school teachers.

Delivering lectures through educational technology is seen more affirmatively by the teachers in the Primary schools than those in the Elementary schools. Particularly for primary school students, the real equipments that they see and touch are more meaningful. Hence, students must be taught concrete things first and after then abstract things can be benefited. The concrete things facilitate the teachings of abstract things. Audio-visual equipments and especially the latest developments in computer technology facilitate this principle to be applied in each level and course of education.

Suggestions

1. Facilities of delivering lectures in Primary Schools must be developed. Hence, the number of technologically rigged classrooms must be increased and their effective use must be optimally formed.

2. In service education courses on educational equipments organized by the Ministry of Education must be revised. Topics like production of equipment that would pave the way for teachers to improve their creative powers must be dealt with in these courses.

3. Ministry of Education and Universities cooperatively organize in-service educational courses in accordance with contemporary educational technology that would meet the needs of today. Taking teachers positive attitude towards computers into consideration, the courses must also focus on computerized communication technologies.

4. In Primary schools infrastructural deficiencies on educational technologies attract our attention. The deficiencies originate on account of the limited share that is allocated to education by national economy. In addition to the government investments, private entrepreneurs must be encouraged to invest in order to get rid of unemployment as soon as possible.

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PERCEPCIJA UČITELJA O KORIŠTENJU OBRAZOVNIH TEHNOLOGIJA U PROCESU POUČAVANJA

Suleyman Dogan

Sažetak - *Tehnološki razvoji prilagođeni su i obrazovanju. Napredna obrazovna oprema integrirana je u obrazovanje i učitelji je koriste u učionici. Cilj ovog rada je utvrditi pozitivne i negativne učinke tehnološke opreme na učitelje. U istraživanju je sudjelovalo 1014 slučajno odabranih učitelja osnovnih i srednjih, privatnih i državnih škola (Ženski spol N = 525, Muški spol N = 489) u Istanbulu. Podaci su prikupljeni upitnikom "Učiteljska percepcija obrazovnih tehnologija" koji je izradio autor. Upitnik ima 27 čestica. Podaci su analizirani statističkim računalnim programom. Dobiveni podaci ukazuju na to da je učiteljska primjena obrazovnih tehnologija tijekom školske godine vrlo efikasna i učitelji podupiru njihov intenzivni razvoj.*

Ključne riječi*: učitelji, poučavanje, percepcija, obrazovne obrazovne tehnologije*