EXAMINING PRE-SERVICE TEACHERS' ATTITUDES AND INTERESTS IN TECHNOLOGY IN TERMS OF VARIOUS VARIABLES

Asst. Prof. Dr. Murat Tolga KAYALAR

Erzincan Binali Yıldırım University, Faculty of Education, Erzincan / TURKEY, ORCID: 0000-0003-2442-9330

ABSTRACT

It is important for pre-service teachers to develop attitude and interest in digital technology in terms of raising awareness of their attitudes towards digital technology, achieving the goals determined in the education programs, sharing information, increasing student success and educating teachers who can keep up with the digital era. In the study, we tried to determine the interests and attitudes of pre-service teachers to digital technology in school environment. Qualitative research method was used in the study to analyse the data obtained from 320 pre-service teachers at the departments of Computer and Instructional Technologies, Science Teaching, Classroom Teaching and Psychological Counselling and Guidance Teaching in the Faculty of Education, Erzincan University. To collect necessary data, Technology Attitude Scale (TAS) developed by Yavuz was used, which is of 5 factors and 19 items, and SPSS program was used to analyse the data. In the study it was determined that the attitude of the pre-service teachers to technology was high, in terms of gender and age, the interest in technology was higher in females and the young rather than male and older ones. The pre-service teachers in our study generally use internet for five to seven hours a day. They use smart phones much more than any other digital tools such as laptop, tablet, notebook and PC, which suggests that pre-service teachers use technology whenever and wherever they wish.

Key Words: Technology Attitude Scale (TAS), Pre-service teachers, Interest in technology, Learning environment

1. INTRODUCTION

In today's conditions, where the use of technology becomes a necessity rather than a privilege, people need to acquire knowledge, skills, attitudes and habits to constantly adapt to the developing technology, to understand the technology and to benefit from the opportunities it offers. Through education, it is aimed to equip individuals with the skills to reach, organize and evaluate and present information and to communicate (Akkoyunlu, 1995; Yılmaz et al, 2010; Kayalar, 2016). Towards the end of the last century, the use and expansion of technology was used in schools as well as in other institutions of the society, but the issue of how technology should be used and included in the regulation of education programs still has been discussed (Slowinsky, 2000). For this reason, parallel to the developments in their technologies, new researches have been introduced in educational sciences and the attitudes of students towards technological devices have been determined and importance has been given to creating the necessary education policies and strategies in order to make more reasonable use of investments in this field (Yavuz and Coşkun, 2008).

It is thought that students' attitudes towards digital technologies will have an impact on the design and organization of teaching environments. In many studies on information systems, one of the very important and strong factors affecting the successful use of information systems in any institution is defined as attitude (Gokhale et al, 2013). Thus, attitude to technology in education is of great importance in development some skills of the students for academic achievement (Kayalar, 2017).

1.1. Technology in Education

It is an urgent need for human beings to develop and change the technology rapidly. Humans are facing new technological tools and requirements for almost every day. The benefits of these tools to humanity, as well as their perception of the use of these tools are very important for them to be used as a direction. Therefore, individuals should be educated by technologies through formal and informal training in order to adapt technological innovations to their daily lives (Çepni, 2005).

Education systems are required to raise individuals in the qualities that societies need. One way to solve this problem to make teaching-learning processes more efficient is to educate qualified individuals through integrating technology with education. Although technology is not a solution that can overcome all educational problems, recently technologies have become necessary tools for teaching and auditory learning (Kayalar and Kayalar 2017). In order to benefit from technology in educational systems, qualified teachers should be trained (Şemsettin and Odabaşı, 2004; Kirschhner and Selinger, 2003; Güler Arı, 2016).

Technology has an important role in teaching and learning process. Therefore, teachers, instructors, mentors and trainers need to unite their fields of work with technology (Akkoyunlu, 2002; Küçükali and Görgülü, 2017). In the studies, it is stated that the pre-service teachers have graduated from the faculties of education with limited knowledge about how to use technology in their courses, so even though the teacher candidates have taken this course in their pre-service training, they have problems in using instructional technologies and developing the material. A lot of teachers have deficiencies in terms of using technology in teaching processes since they cannot be equipped with sufficient knowledge and skills in teaching technologies in pre-service training (Uçar, 1999; Teo et al, 2009). Some teachers and students are not so willing to use new technologies in teaching-learning processes. They are unaware that using ICT will increase their performance and productivity in educational process (Anni et al, 2018).

In the education of pre-service teachers, theoretical information such as the characteristics of teaching technologies, its place and importance in the teaching process are taught but their use is not taught. There are problems in teaching the use of instructional technologies which are among the objectives of the course, and perhaps in the acquisition of pre-service teachers for various reasons such as technological deficiencies and lack of qualified teaching staff. It has been stated that there are suitable technology laboratories in faculties that educate pre-service teachers (Alkan, 1997; İşman, 2002; Carle et al, 2009). Nowadays, it is necessary for the pre-service teachers to be able to demonstrate both the ability to use the technology very well and to use these technologies at the optimum level of efficiency in the teaching-learning process. Technology perspectives are very important for pre-service teachers to make more efficient and effective use of technology. Technological developments create new educational requirements for educational applications.

1.2. Attitude to Technology

Attitude can be defined as the tendency attributed to a person and that person's emotions, thoughts and behaviours regularly on a psychological object (Kağıtçıbaşı, 1999; Aslan and Kan, 2017). Attitude can be expressed as a tendency towards an object, which is exhibited to a certain degree and shows itself in a positive or negative way (Murugaiyan and Arulsamy, 2013; Eagly and Chaiken, 2007).

Attitude generally consists of three sub-components: cognitive, affective and behavioural. In this sense, the attitude towards an object can affect the perception, behaviour or preference of the individual about that object. For example, an attitude towards an object involves being against that object or being on that object side (Anderson and Hughes, 1989). In this respect, special education teachers are interested in assistive technologies. The determination of their attitudes can be interpreted as an indication of the extent to which they are in favour of supporting technology applications (Aslan and Kan, 2017).

The role of teachers is particularly important in the adaptation of technology to education and training (Oktay and Çakır, 2012). Teachers' attitude towards technology, their efforts to use technology and the ability to use them will undoubtedly affect the technology attitude of their students. Yıldırım (2007) found that teachers use technology to create study papers and exams in the preparatory phase, rather than supporting students' cognitive levels and conceptual learning. He stated that they had difficulty in

adapting the technology to education due to lack of in-service training of teachers and insufficient education in university.

2. METHOD

The study was carried out in Quantitative Research Method as the data were collected through Technology Attitude Scale (TAS), and the data were analysed using SPSS 2.0 to determine the pre-service teachers' attitude towards technology. Descriptive Statistical Analyses were used for the analysis of the data.

2.1. Purpose of the Research

The research consists of two parts. In the first part, we aimed to determine whether each student has computer, the time spent with computer, ways of connecting to internet and the goals of internet usage. In the second part of the study, we aimed to determine the attitudes and opinions of the pre-service teachers on the use of technological equipment in education and to examine them according to their demographic characteristics such as gender, age, department and grade.

2.2. Universe of the Research

The research consists of 320 pre-service teachers, 86 from the departments of Computer and Instructional Technologies (CIT), 40 from Science Teaching (ST), 58 from Classroom Teaching (CT) and 136 from Psychological Counselling and Guidance Teaching (PCGT) in the Faculty of Education, Erzincan University. 122 participants are male and 198 female. The distribution of age, department and grade is shown in table 1.

Table 1: Demographic İnfo of Gender, Age, Department and Grade

Demographic info		N	f
Gender	Male	122	38,1
	Female	198	61,9
Age	18-20	227	70,9
	21 and over	93	29,1
Department	CIT	86	26,9
	ST	40	12,5
	PCGT	136	42,5
	CT	58	18,1
Grade	1	192	60,0
	2	72	22,5
	3	45	14,1
	4	11	3,4
	Total	**320**	**100**

2.3. Data Collection Tool

In order to collect data, the Technology Attitude Scale (TAS) developed by Yavuz (2005) was applied to 320 pre-service teachers in the Faculty of Education. The scale consists of 5 dimensions and 19 items that include the none-use of technological tools in education, the use of technological tools in education, the effects of technology on educational life, the instruction of technological tools and the evaluation of technological tools. The reliability of the scale was calculated by Cronbach's alpha method and the reliability coefficient of the test was found to be 0.87. The total correlations of the items for substance discrimination and substance strength ranged from 0.24 to 0.68 (Yavuz, 2005). The reliability of the scale was found to be 0,85 in this study.

2.4. Analysis of the Data

Descriptive Statistical Analyses were used for the analysis of the data. First of all, inverse items were converted to positive and interpretations were made on the average scores taken from the scale. The t-test was used for the independent groups in the group comparisons of the scores of the Technology Attitude Scale (TAS).

Table 2: The Point Ranges and Choices of 5-Likert Scale

Choice	Points	Point Range
Fully Disagree	1	*1,00-1,79*
Disagree	2	*1,80-2,59*
Slightly Agree	3	*2,60-3,39*
Agree	4	*3,40-4,19*
Fully Agree	5	*4,20-5,00*

3. FINDINGS

3.1. Findings of Demographic Information of Participants

The analysis of the data shows that 197 participant pre-service teachers have smartphone, 157 have laptop, 21 have Personal Computer (PC) and 20 have tablet (Table 3). Some have two of these tools.

Table 3: Technological Tools that the Participants Have

		N	f
Technological Tools	PC	21	6,6
	Labtop	157	49,1
	Tablet	20	6,3
	Smartphone	197	61,6
	None*	0	0

The duration that the participants spend in front of computer is shown in Table 4. According to the statistical data, 146 of the participants spend 2 to 5 hours a day, 66 participants a few times a day, 54 participants less than one hour a day, 38 participants less than 5 hours a day, and 16 participants a few times a month.

Table 4: The Duration that the Participants Spend in Front of Computer

		N	f
Duration	Less than 5 hours a day	38	11,9
	2 to 5 hours a day	146	45,6
	Less than one hour a day	54	16,9
	A few times a day	66	20,6
	A few times a month	16	5,0
	Toplam	320	100

The participants' access to internet is shown in Table 5. According to the data, 67 of the participants access to internet at school, 19 at home, and 234 access to internet both at home and at school. This suggests that 21% of the participants don't have internet access at home.

Table 5: Connection to Internet

		N	f
Connection to Internet	At home	19	5,9
	At school	67	20,9
	Both	234	73,1

The participants' aims of using internet are shown in table 6. All of the participants use internet more than one reason. 260 of the participants use internet for studying, 215 for watching films and videos, 214 for listening to music, 211 for social communication such as Twitter and Facebook, 202 for preparing for study notes, 174 for e-mail, 126 for e-purchasing, 91 for reading newspapers and magazines, and 89 for playing games. These findings show that most of the participants use internet for the purpose of education.

Table 6: The Aim of Using Internet

Aim of using internet	N	f
Studying	260	81,3
Watching film video	215	67,2
Listening to music	214	66,9
Social Communication (Twitter, Facebook..)	211	65,9
Preparing for study notes	202	63,1
Mail (e-mail)	174	54,4
Purchasing	126	39,4
Reading newspaper magazines	91	28,4
Playing games	89	27,8

3.2. Findings related to Technology Attitude Scale (TAS)

The findings related to pre-service teachers' attitudes to technology are shown in table 7. In the following table are mean scores of each item and total points of pre-service teachers.

Table 7: Findings Related to Technology Attitude Scale (TAS)

Items	N	$\overline{X}$
1. E-mail is used for communication, not necessary in the field of education. *	320	4,44
5. Technological tools do not need to be used in the lecture. *	320	4,44
3. The use of the Internet in the teaching process is nothing but a waste of time. *	320	4,40
4. The use of technological tools has no effect on student motivation.	320	4,30
10. The use of existing technologies enables the development of new technologies.	320	4,21
9. Students should be given basic courses about computer literacy.	320	4,13
16. Students should be given preliminary information about the use of new technologies.	320	4,13
8. Technological tools can be used for exercise and repetition purposes.	320	4,12
17. The use of new technologies in teacher training should be increased.	320	4,09
2. Devices such as overhead, slide, projection should not be preferred due to the time consuming.	320	4,00
11. In terms of efficient work and learning, the possibilities of technology have a positive effect.	320	3,93
12. It will be easier to understand the difficult lessons with the use of technology.	320	3,90
7. The ability to repeat video bands provides feedback to the students.	320	3,88
19. In order to graduate from the University, the ability to use technological materials related to the subject area should be rated.	320	3,84
6. Video recording of certain parts of the courses allows the students to see their deficiencies and errors.	320	3,51
14. Daily and annual plans should be prepared by teachers using computers.	320	3,50
18. Technological tools are successful only when they cover all senses.	320	3,40
15. During the course, computer-assisted instruction should be frequently included.	320	3,38
13. In order to be successful in life, it is not necessary to take advantage of technology opportunities.	320	3,06
Total point	320	74,60

*Reversed items

In examining table 2, pre-service teachers' attitudes towards technology seem to be positive (= 74,6281). Based on this finding, it can be said that pre-service teachers have positive attitudes.

The findings related to the difference between attitude points of the pre-service teachers in terms of gender are shown in Table 8.

Table 8: T Test Scores Related to Attitude Points of Pre-service Teachers in Terms of Gender

Group	N	$\overline{X}$	S	t	df	p
Male	122	73,107	11,561	1,938	318	0,053
Female	198	75,57	10,678			

The findings related to the difference between attitude points of the pre-service teachers in terms of age are shown in Table 9. According to the analysis of the data, it was determined that no significant difference was found between attitude points of pre-service teachers in terms of age.

Table 9: T Test Scores Related to Attitude Points of Pre-service Teachers in Terms of Age

Group	N	$\overline{X}$	S	t	df	p
18-20 years	227	74,2203	11,31116	1,030	318	0,304
21 and over	93	75,6237	10,44854			

The findings related to the difference between attitude points of the pre-service teachers in terms of department are shown in Table 10. When the results of the analysis are examined, it is seen that there is a significant difference between the pre-service teachers' attitude scores to technology (F (3, 316) = 5,960, p = 0,001 <0,05). According to the results of the Scheffe test conducted to find out which of the groups were different among the sections, the pre-service teacher candidates in the CIT department (= 77,709, S = 8,49) have a more positive attitude than those in the ST department (=69,18, S=12,99).

Table 10: ANOVA Scores Related to the Attitude Points of Pre-service Teachers in Terms of Department

Source of variance	Total squares	sd	Mean squares	F	p	Significant difference
Intergroups	2093,202	3	697,734	5,960	,001*	CTT>ST
Innergroups	36995,545	316	117,075			
Total	39088,747	319				

Findings related to the difference between pre-service teachers' attitude points in terms of grade variable are shown in Table 11. According to the analysis of the data, it was determined that no significant difference was found between attitude points of pre-service teachers in terms of grade variable

Tablo 11. ANOVA Results of Pre-service Teachers' Attitude Points in Terms of Grade Variable

Source of variance	Total Squares	sd	Mean squares	F	p	Significant difference
Intergroups	848,893	3	282,964	2,338	,074	-
Innergroups	38239,854	316	121,012			
Total	39088,747	319				

4. CONCLUSION

As a result of this research, the attitudes of the pre-service teachers at the departments of Computer and Instruction Technologies (CIT), Science Teaching (ST), Classroom Teaching (CT) and Psychological Counselling and Guidance Teaching (PCGT) in the Faculty of Education, Erzincan University towards the use of technological tools in education were determined. The analysis of the data obtained through Technology Attitude Scale suggests that the pre-service teachers in our study have noticeable level of attitude towards technology in education. Of all the pre-service teachers in our study, those in Computer and Instruction Technologies (CIT) have the furthest attitude toward technology. This can be explained with their characteristics of department as the graduates from this department will be CIT teachers after graduation.

We have the conclusion that the attitudes of the pre-service teachers to the use of technology in teaching are positive and they mostly regard that instructional technologies can be effective in education. Similar findings to this result can be seen in the studies conducted by Kayalar (2016), Dargut and Çelik (2014) and Çuhadar and Yücel (2010). According to the results of these authors, the majority of pre-service teachers consider themselves to be successful in using computer and communication technologies for teaching purposes. Almost all of the pre-service teachers have more than one technological tool such as smartphone, PC, Laptop, Tablet and they use them for studying and preparing study notes, which means that they have a positive attitude toward technology in education.

REFERENCES

[1] Akkoyunlu, B. (1995). Bilgi teknolojilerinin okullarda kullanımı ve öğretmenlerin rolü. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi.* Sayı 11, 105-109.

[2] Anni, C. T., Sunawan & Haryono (2018). School Counselors' Intention to Use Technology: The Technology Acceptance Model. *TOJET: The Turkish Online Journal of Educational Technology*, April 2018, volume 17 issue 2

[3] Aslan, C. & Kan, A. (2017). Yardımcı teknolojilere yönelik tutum ölçeği geliştirme çalışması. *Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi,* 17 (1), 48-63.

[4] Carle, A. C., Jaffee, D., & Miller, D. (2009). Engaging college science students and changing academic achievement with technology: A quasi-experimental preliminary investigation. *Computers & Education,* 52, 376–380.

[5] Çelik, H. C. & Kahyaoğlu, M. (2007). İlköğretim Öğretmen Adaylarının Teknolojiye Yönelik Tutumlarının Kümele Analizi. *Türk Egitim Bilimleri Dergisi*, Güz 2007, 5(4), 571-586

[6] Çepni, S. (2005). Fen ve teknoloji ögretimi. *Pegem A Yayınları.* Ankara, 2005

[7] Çuhadar, C. ve Yücel, M. (2010). Yabancı dil öğretmeni adaylarının bilgi ve iletişim teknolojilerinin öğretim amaçlı kullanımına yönelik özyeterlik algıları. *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi*, 27, 199-210.

[8] Dargut, T & Çelik, G. (2014). Türkçe Öğretmeni Adaylarının Eğitimde Teknoloji Kullanımına İlişkin Tutum ve Düşünceleri. *Ana Dili Eğitimi Dergisi,* 2(2), 28-41.

[9] Gokhale, A. A., Brauchle, P. E. & Machina, K. (2013). Scale to measure attitudes toward information technology. *International Journal of Information and Communication Technology Education.* 9(3), 13-26.

[10] Güler Arı, T. (2016). Study into the views of the students learning Turkish as a foreign language over collaborative learning in language courses. *Education Research Journal* Vol. 6(10): 188 – 192, October 2016

[11] Kayalar, F. (2016). Cross-cultural Comparison of Teachers' Views upon Integration and Use of Technology in Classroom. *TOJET: The Turkish Online Journal of Educational Technology* – April 2016, volume 15 issue 2.

[12] Kayalar, F. (2017). Research into the Veteran Teachers' Views over the Effects of Self-Directed Learning Environment on Students' Academic Achievements (Cross-Cultural Study) *Turkish Studies International Periodical for the Languages, Literature and History of Turkish or Turkic*, Volume 12/28, p. 503-515

[13] Kayalar, F. & Kayalar, F. (2017). The effects of Auditory Learning Strategy on Learning Skills of Language Learners (Students' Views). *IOSR Journal of Humanities And Social Science (IOSR-JHSS)* Volume 22, Issue 10, Ver. VII (October. 2017) PP 04-10

[14] Küçükali, R. & Görgülü, D. (2017). Temel eğitim kurumlarında görev yapan öğretmenlerin eğitim teknolojisi standartlarına ilişkin özyeterlik durumları. *Eğitim ve Öğretim Araştırmaları Dergisi Journal of Research in Education and Teaching*, Kasım 2017 Cilt: 6 Sayı: 4

[15] Murugaiyan, A., & Arulsamy, S. (2013). Attitude of student teachers towards integration of assistive technology in inclusive classrooms. *International Journal of Teacher Educational Research (IJTER)*, 2(4), 1-8

[16] Oktay, S & Çakır, R. (2012) http://kongre.nigde.edu.tr/xufbmek/dosyalar/tam_metin/pdf/2379-30_05_2012-14_55_26.pdf (Reached on 30. 08. 2018)

[17] Slowinski, J. (2000). Becoming a technologically savvy administrator. *ERIC Digets,* Number 135.

[18] Şemseddin, G. & Odabaşı, F. (2004). Bilgi çağında ögretmen adaylarının eğitimde öğretim teknolojileri ve materyal gelistirme dersinin önemi. *The Turkish Online Journal of Educational Technology*, 3(1).

[19] Teo, T., Lee, C.B., Chai, C.S., & Wong, S.L. (2009). Assessing the intention to use technology among preservice teachers in Singapore and Malaysia: A multigroup invariance analysis of the Technology Acceptance Model (TAM). *Computers and Education*. Issue 53, 1000-1009.

[20] Yavuz, S. (2005). Developing a technology attitude scale for pre-service chemistry teachers. *The Turkish Online Journal of Educational Technology*, Volume 4, 1–9.

[21] Yılmaz, I., Ulucan, H., & Pehlivan, S. (2010). Beden Eğitimi Öğretmenliği Programında Öğrenim Gören Öğrencilerin Eğitimde Teknoloji Kullanımına İlişkin Tutum ve Düşünceleri. *Ahi Evran Üniversitesi Eğitim Fakültesi Dergisi,* Cilt 11,Sayı 1,Nisan 2010,Sayfa 105-118

[22] Yavuz, S & Coskun, A.S. (2008). Sınıf öğretmenliği öğrencilerinin eğitimde teknoloji kullanımına iliskin tutum ve düsünceleri, *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi.* 34, 274-286.

[23] Yıldırım, S. (2007). Current utilization of ICT in Turkish basic education Schools: A review of Teacher's ICT use and barriers to integration. *International Journal of Instructional Media*, 34(2) 171-186