

## An examination of relationship between teachers' self-efficacy perception on ICT and their attitude towards ICT usage in the classroom

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### Abstract

The aim of this study is to examine the relationship between teachers' self-efficacy perception on ICT and their attitude to ICT usage in the classroom. For this purpose, two scales were used: 'Teachers' Self-efficacy Perception on ICT Scale' and the 'Teachers' Attitude towards ICT Usage Scale'. A total of 42,307 teachers took part in this study. Mean, standard deviation, Pearson correlation and linear regression analyses were used to analyse the collected data. A significant relationship was found between teachers' self-efficacy perception on ICT and their attitude towards ICT usage in their classrooms. According to the findings, it can be said that if teachers' self-efficacy level is high, teachers can use ICT in the learning process effectively and they can develop themselves in ICT use. Moreover, they can improve class management while using ICT.

**Keywords:** Self-efficacy, teachers' attitude towards ICT usage, self-efficacy in ICT, teacher.

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## 1. Introduction

With the development of technology, its use in education has increased, and it can be argued that with the support of technology, education has improved (Drucker, 2000). However, it is vital to understand how to integrate technology with education, and how to use technology as a tool in education (Alkan, 1997). In studies on the integration of technology with education, there are many dynamics such as: teachers, students, school principals, educational programmes and school culture. The most influential actor of these dynamics is 'teachers'. This is because teachers are the only actors who can combine both technological and pedagogical perspectives (Al-Zahrani & Robertson, 2012; Bilici, 2011; Deniz, 2000; Scherer, Rohatgi & Hatlevik, 2017; Yusuf, 2011). Moreover, if they can combine these perspectives, they can enhance students' experience of learning in their classrooms (Yesilyurt, Ulas & Akana, 2016). In this context, both developed and developing countries have begun to implement technology-based educational policies. One of the most important of these technology-based educational policies is the FATİH Project in Turkey.

The FATİH Project was initiated by the Ministry of Education in 2010 to promote the use of technology in education (MEB, 2010). When studies about this project are reviewed, it is seen that, generally, these studies focus on the functions of hardware and software, the ICT literacy of teachers and students, and the perception and attitudes of the beneficiaries and users of the project (Alkan, Bilici, Akdur, Temizhan & Cicek, 2011; Bilici, 2011; Dincer, 2011; Dincer, Senkal & Sezgin, 2013; Sunkur, Arabaci & Sanli, 2012). Although theoretically it is known that there is a relationship between teachers' self-efficacy on ICT and their use of ICT in their classrooms, there is little research on this subject. Therefore, the aim of this study is to examine the relationship between teachers' self-efficacy perception on ICT and their attitude towards ICT usage in their classrooms.

## 2. Literature review

This study examines the relationship between teachers' beliefs on the self-efficacy of ICT and their attitude towards the use of ICT in their classrooms. First, the concepts 'self-efficacy' and 'attitude' are defined. Then, their positive effects on teachers' ICT usage are briefly given. Finally, the relationship between teachers' beliefs on the self-efficacy of ICT and their attitude towards ICT usage is discussed.

The concept of self-efficacy was introduced in the early 1970s by Bandura. It is mostly defined as 'one's beliefs in his/her own capacity and ability in order to complete or accomplish something—complete a task' (Bandura, 1997). It is a key concept in social cognitive theory and comprises three main parts: one's personality (his/her capacity and ability), his/her behaviours (try to complete or accomplish something) and environment (task) (Bandura, 1997; Zimmerman, 2000). If a person's self-efficacy is high, he/she thinks that he/she will accomplish the specific task easily. In social cognitive theory, self-efficacy has four dimensions: his/her own experiences, others' experiences, verbal persuasion and emotional states (Bandura, 1997). According to the research, some teachers have low self-efficacy and because of this they do not want to use ICT in the classroom (Akkoyunlu & Orhan, 2003; Al-Zahrani & Robertson, 2012; Yusuf, 2011).

Like the term 'self-efficacy', the term 'attitude' is also important for ICT usage in education. This is because if teachers have high self-efficacy and positive attitudes towards ICT usage, they can use it in their classroom effectively (Al-Zahrani & Robertson, 2012). The term 'attitude' is defined as someone's positive or negative feelings, opinions or behaviours on any situations, events or things (Guskey, 1988). When studies on teachers' attitudes towards ICT usage are reviewed, it can be said that teachers, mostly, have a positive attitude towards ICT usage in education (Celik & Kahyaoglu, 2007; Chai, Hong & Teo, 2009; Dincer et al., 2013; Guskey, 1988). Teachers want to use ICT in education because they think that ICT provides powerful tools to enhance both learning and teaching (Uslu & Bumen, 2012). It can transform the present isolated, teacher-centred and text-bound classrooms into technology enriched, student-centred and interactive knowledge environments (Elsaadani, 2013).

Besides this, it gives good opportunities in terms of learning efficiency and quality at the individual, group and societal levels (Rastogi & Malhotra, 2013).

The aim of this study is to examine the relationship between teachers' self-efficacy perception on ICT and their attitude towards ICT usage in their classrooms. The study asks four questions:

1. What is the level of teachers' self-efficacy on the use of ICT?
2. What is the level of teachers' attitude towards ICT use in classrooms?
3. Is there a significant relationship between teachers' self-efficacy perception on ICT and their attitude towards ICT usage in their classrooms?
4. Is teachers' self-efficacy perception on ICT a predictor of teachers' attitude towards ICT use in the classroom?

### 3. Method

A descriptive method was used in the current study to examine the relationship between teachers' self-efficacy perception on ICT and their attitude towards ICT usage in their classrooms. For this purpose, 42,307 teachers voluntarily joined the research. Data from about 10,000 teachers were cleaned because of technical problems; for the study, data from 32,989 teachers were used. In Turkey, in the scope of FATİH Project, normally, there are 600,000 teachers who have taken courses on using ICT in education. Table 1 shows the demographic characteristics of the subjects.

**Table 1. Demographic characteristics of participants**

Demographic characteristics	Variables	n = 32989	Percentage
Gender	Male	14,625	44
	Female	18,364	56
Age	21–30	8,926	27
	31–40	14,614	44
	41–50	7,353	22
	51–60	1,926	6
	61+	170	1
	Educational Status	undergraduate	28,916
Post-graduate		4,073	12
Career	1–5 years	9,073	27
	6–10 years	7,289	22
	11–15 years	5,678	17
	16–20 years	5,228	16
	21–25 years	3,414	11
	26+ years	2,307	7
Computer at home	Yes, I have	31,138	94
	No, I have not	1,851	6
Internet at home	Yes, I have	29,433	89
	No, I have not	3,556	11

Table 1 shows that 56% of the participants were female and 44% were aged between 31 and 40. Furthermore, most had been working for more than 10 years. In addition, most had computers (94%) and the Internet (89%) at home.

In this quantitative study, two scales were used to determine the teachers' opinion on ICT usage: one is 'Teachers' Self-Efficacy Perception on ICT Scale' developed by Askar and Umay (2001); it has one dimension. The other is 'Teachers' Attitude towards ICT Usage Scale' developed by Ozturk (2006); this has three dimensions: ICT usage in learning process, self-development in ICT use and class management while using ICT.

The researcher prepared the data collection tool on the online survey programme *www.surveymonkey.com*. Then, teachers filled the prepared data collection tool via a link to the website. The link was sent to the teachers with an official letter so, mostly, teachers who had taken ICT courses in FATIYH Project joined the study. The collected data were analysed via SPSS 23. Mean, standard deviation, Pearson correlation and linear regression analyses were used to analyse the collected data.

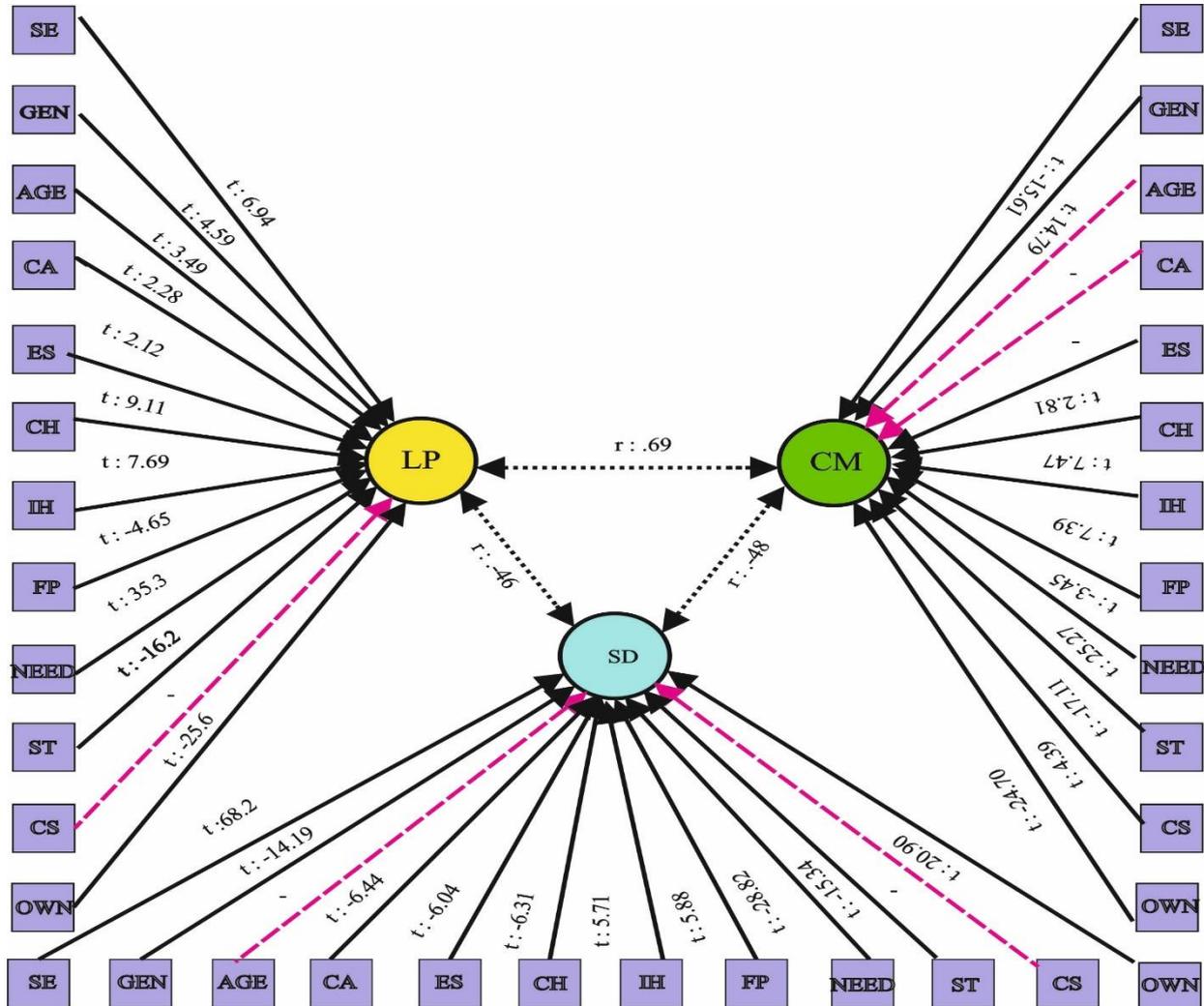


Figure 1. Research model according to the findings of correlation and regression analysis

A pilot study was conducted with 1,087 participants in 81 provinces to test validity and reliability of the scales. The fit index results of CFA were:  $\chi^2 = 7489.30.33$ ,  $df = 1473$ , root mean square error of approximation (RMSEA) = 0.060, GFI = 0.80, AGFI = 0.80, NFI = 0.90, NNFI = 0.90, root mean square residual (RMR) = 0.08 and standardised root mean square residual (SRMR) = 0.04. It can be said that  $\chi^2/df$  value is below 5; the RMSEA value is below 0.08; the SRMR value is below 0.08 (see Appendix 1). Within this scope, it can be expressed that the modelling is fixed (Kline, 2005). Besides this, for the internal consistency reliability of the scales, the Cronbach's alpha values were 0.90, 0.93, 0.93 and 0.91 for 'ICT usage in learning process', 'Self-development in ICT use', 'Class management while using ICT' and 'Teachers' self-efficacy perception', respectively.

#### 4. Findings

The results were analysed via SPSS. First, standard deviation and the mean of the variables were calculated and are given in Table 2. Then, Pearson correlation analysis was conducted to see whether there was a significant relationship between teachers' self-efficacy perception on ICT and their attitude towards ICT usage in their classrooms. This can be seen in Table 3. Finally, linear regression analysis was done to find out if teachers' self-efficacy perception is a predictor of teachers' attitude towards ICT usage in their classrooms (see Table 4). Table 2 shows standard deviation and mean of the variables.

**Table 2. Mean and standard deviation of the variables**

Scale name	Dimensions	$\bar{X}$	Ss
Teachers' Attitude towards ICT Usage	ICT usage in learning process	4.29	0.59
	Self-development in ICT use	3.71	0.71
	Class management while using ICT	3.97	0.71
Teachers' Self-efficacy Perception on ICT	Total point of teachers' self-efficacy perception on ICT	3.49	0.63

Table 2 shows that teachers' ICT usage in the learning process is at a very high level ( $\bar{X} = 4.29$ ). However, self-development in ICT use is also at a high level ( $\bar{X} = 3.71$ ). The reason for these findings might be the courses given in the project. The courses focus on learning processes directly, but they are related to self-development in ICT use in an indirect way. Teachers' self-efficacy perception on ICT is ( $\bar{X} = 3.49$ ) lower than other values. The reason for this finding might be that students are members of the digital age and have more knowledge about ICT than their teachers. Table 3 shows a significant relationship between teachers' self-efficacy perception on ICT and their attitude towards ICT usage in their classrooms.

**Table 3. Correlations among variables in the scales**

Variables	1	2	3	4
1. Total points of teachers' self-efficacy perception on ICT	-	-0.10*	0.41*	-0.16*
2. ICT usage in learning process		-	-0.46*	0.69*
3. Self-development in ICT use			-	-0.48*
4. Class management while using ICT				-

\*Correlation is significant at the 0.01 level (two-tailed).

Table 3 shows there is a significant relationship at a medium level between total points of teachers' self-efficacy and 'self-development in ICT use' ( $r = 0.41, p < 0.01$ ). However, there is a significant low-level relationship in a negative way between total points of teachers' self-efficacy and 'ICT usage in learning process' ( $r = -0.10, p < 0.01$ ), and 'class management while using ICT' ( $r = -0.16, p < 0.01$ ). It can be said that while teachers' self-efficacy level is high, their self-development in ICT use is also high.

Table 4 shows the results of the linear regression analysis. The whole independent variables have significant relationships with 'ICT usage in learning process' ( $R = 0.29, p < 0.05$ ), 'self-development in ICT use' ( $R = 0.47, p < 0.05$ ) and 'class management while using ICT' ( $R = 0.28, p < 0.05$ ). According to the regression analysis, the significant predictors of 'ICT usage in learning process' are teachers' self-efficacy in ICT use ( $\beta = 0.03, p < 0.05$ ), gender ( $\beta = 0.02, p < 0.05$ ), age ( $\beta = 0.03, p < 0.05$ ), career ( $\beta = 0.02, p < 0.05$ ), educational status ( $\beta = 0.01, p < 0.05$ ), computer at home ( $\beta = 0.04, p < 0.05$ ), Internet at home ( $\beta = 0.04, p < 0.05$ ), FATIH courses ( $\beta = 0.02, p < 0.05$ ), need of ICT ( $\beta = 0.18, p < 0.05$ ), in-service training ( $\beta = 0.10, p < 0.05$ ) and learning ICT on your own ( $\beta = 0.14, p < 0.05$ ). From the analysis, the significant predictors of 'self-development in ICT use' are the whole variables except with age ( $\beta = 1.90, p > 0.05$ ) and colleague support in ICT learning ( $\beta = 0.11, p > 0.05$ ). The significant predictors of 'class management while using ICT' are all of the variables except with teachers' age ( $\beta = 1.41, p > 0.05$ ) and their careers ( $\beta = 1.75, p > 0.05$ ). According to these findings, it can be said that

if teachers' self-efficacy level is high, teachers can use ICT in the learning process effectively, and they can use ICT to develop themselves. Moreover, they can improve class management by using ICT.

**Table 4. Linear regression analysis results of variables**

Variables	ICT usage in learning process			Self-development in ICT use			Class management while using ICT		
	$\beta$	$t$	$p$	$\beta$	$t$	$p$	$\beta$	$t$	$p$
Constant		92.03	0.00*		84.49	0.00*		85.51	0.00*
Self-efficacy	-0.03	6.94	0.00*	0.35	68.74	0.00*	-0.08	-15.61	0.00*
Gender	0.02	4.59	0.00*	-0.07	-14.19	0.00*	0.08	14.79	0.00*
Age	0.03	3.49	0.00*	0.01	1.90	0.06	0.01	1.41	0.15
Career	0.02	2.28	0.02*	-0.05	-6.44	0.00*	-0.01	-1.75	0.08
Educational Status	0.01	2.12	0.03*	-0.02	-6.04	0.00*	0.01	2.81	0.00*
Computer at home	0.04	9.11	0.00*	-0.02	-6.31	0.00*	0.04	7.47	0.00*
Internet at home	0.04	7.69	0.00*	0.02	5.70	0.00*	0.04	7.39	0.00*
FATİH courses	-0.02	-4.65	0.00*	0.03	5.88	0.00*	-0.02	-3.45	0.00*
Need of ICT	0.18	35.37	0.00*	-0.14	-28.82	0.00*	0.13	25.27	0.00*
In-service training	-0.10	-16.29	0.00*	0.08	15.34	0.00*	-0.10	-17.11	0.00*
Colleague support	-0.00	-1.42	0.15	0.00	0.11	0.91	0.02	4.39	0.00*
On your own	-0.14	-25.66	0.00*	0.10	20.90	0.00*	-0.13	-24.70	0.00*

ICT usage in learning process:  $R = 0.29$ ,  $R^2 = 0.22$ ;  $F = 264.28$ ,  $p < 0.05$ .

Self-development in ICT use:  $R = 0.47$ ,  $R^2 = 0.51$ ;  $F = 782.33$ ,  $p < 0.05$ .

Class management while using ICT:  $R = 0.28$ ,  $R^2 = 0.08$ ;  $F = 245.87$ ,  $p < 0.05$ .

## 5. Discussion and conclusion

The primary intention of this study was to determine if there was a significant relationship between teachers' self-efficacy perception on ICT and their attitudes towards ICT use in their classes. Teacher's positive attitudes towards using ICT, together with high levels of self-efficacy regarding ICT, are essential for improving the quality of education. It was also seen that high level ICT skills were vital for sustainability and quality in education. As a result of the findings, it could be said that while teachers' self-efficacy levels were high, their self-development in ICT use was also high. In the study, it could be said that teachers had positive attitudes for their self-development in the use of ICT, and they had high self-efficacy perceptions on ICT use. In particular, teachers' openness to develop themselves in the use of ICT and their reflections on transferring digital technologies to classrooms and learning environments were found to be significant (Cavas, Cavas, Karaoglan & Kisla, 2009). On the other hand, it was concluded that teachers' attitudes towards classroom management were high due to the use of ICT. This could be interpreted that technology-based and student-centred educational approaches were more effective in contributing to classroom management than traditional teaching methods (Kazan & El Daou, 2016). This result is parallel to Gyamfi's (2017) findings. However, it was found that teachers' self-efficacy perceptions for ICT use were lower when compared to the means of other variables. It could be seen as a normal result that teachers' digital literacy skills were relatively low when compared to students known as generation Z, who are brought up with technology (Prensky, 2001).

Second, the researcher tried to find out whether teachers' self-efficacy was a predictor of their attitude towards ICT use in classrooms. According to the findings, it could be said that if teachers' self-efficacy levels were high, teachers might use ICT in the learning process effectively, and they could also develop themselves in using ICT. Besides this, they could improve classroom management while using ICT. These results are parallel to the results of Al-Zahrani and Robertson, and those of Yusuf's studies. From the research, if teachers have low self-efficacy, they do not want to use ICT. However, if they have high self-efficacy, they want to use ICT and they believe if they face a problem with ICT they will overcome it (Al-Zahrani & Robertson, 2012; Yusuf, 2011).

Third, teachers' ICT usage in the learning process was at a very high level. It could be said that teachers, mostly, have a positive attitude towards using ICT in education because they think that ICT enhances students' learning. This result is supported by studies conducted by Chai et al. (2009), Celik and Kahyaoglu (2007), Dincer et al. (2013), Guskey (1988), and Rastogi and Malhotra (2013). Moreover, Acker, Buuren, Karel and Vermeuan (2013) said that teachers who have high self-efficacy use digital learning materials effectively in their classrooms. This study finds that adequate self-efficacy is useful for motivating teachers to engage in continual improvement. Teachers need to use ICT in their teaching process to be more effective in classroom management and to be able to overcome difficulties. This finding is parallel to the results of Elstad and Christophersen's (2017) study. This finding can also be interpreted as the need to develop educational policies that emphasise contributing to the professional development of teachers.

It may be useful to investigate the contribution that teachers' use of ICT makes on enhancing students' experience of learning. Considering the low performance of students in the Turkish education system (according to national and international tests such as the University Entrance Exam, PISA, PIAAC, TIMMS, etc.), it should be shown how the FATİH project contributed to learning processes in classrooms. In this context, it was vital to revise teacher training and development policies (Atasoy & Cemaloglu, 2018). The research revealed that teachers needed in-service training to develop their skills in using ICT in order to be more effective in their learning processes and be more effective in their classroom management. The adverse relationship between teachers' self-efficacy perceptions and their ICT usage in learning processes strengthened these needs (Cavas et al., 2009). As a result, the basic dynamics of quality in education depends on the presence of a teacher capacity equipped with 21st century skills. In this respect, it is important to consider that classrooms should be brought together with technology to increase the ICT literacy skills of teachers within the scope of the FATİH project. However, it is necessary for teachers to enrich their digital learning materials. This will allow them a more active role in the learning processes, and increase their ICT skills and monitor their effectiveness of ICT-supported learning processes.

A qualitative method or a mixed method is recommended to researchers in order to gather more detailed data on teachers' self-efficacy in ICT use and their attitudes towards ICT use in education. Moreover, researchers may build control groups and experimental groups. They may prepare a training programme about self-efficacy in ICT and teachers' attitudes towards ICT use in classrooms. They may conduct a study as they try to find out the effectiveness of the programme.

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### **Authors' Contributions**

Omur Coban and Ramazan Atasoy analysed the sources, the literature framework, contributed to the research procedure, conceptualised and designed the study and wrote the whole manuscript. They carried out a detailed revision too. All authors have read and approved the final manuscript.

### **Conflicts of Interest**

The authors declare no conflict of interest.

## References

- Acker, F., Buuren, H., Karel, K. & Vermeuan, M. (2013). Why teachers use digital learning materials: the role of self-efficacy, subjective norm and attitude. *Education and Information Technologies*, 18, 495–514.
- Akkoyunlu, B. & Orhan, F. (2003). Bilgisayar ve ogretim teknolojileri egitimi bolumu ogrencilerinin bilgisayar kullanma oz yeterlik inanclari ile demografik ozellikleri arasindaki iliski. *The Turkish Online Journal of Educational Technology*, 2(3), 86–97.
- Akkoyunlu, B., Orhan, F. & Umay, A. (2005). Bilgisayar ogretmenleri icin "Bilgisayar Ogretmenligi Oz-yeterlik Olcegi" Gelistirme Calismasi. *Hacettepe Universitesi Egitim Fakultesi Dergisi*, 29, 1–8.
- Alkan, C. (1997). *Egitim teknolojisi* (5. b.). Ankara, Turkey: Ani Yayıncılık.
- Alkan, T., Bilici, A., Akdur, T., Temizhan, O. & Cicek, H. (2011). *Firsatlari artirma teknolojiyi iyilestirme hareketi (FATIH) projesi. 5. Uluslararası Bilgisayar ve Ogretim teknolojileri Egitimi Sempozyumu*. Elazig, Turkey: Fırat Üniversitesi.
- Al-Zahrani, A. & Robertson, M. (2012). Self-efficacy and ICT integration into initial teacher education in Saudi Arabia: matching policy with practice. *Australasian Journal of Educational Technology*, 28(7), 1136–1151.
- Askar, P. & Umay, A. (2001). İlkogretim matematik ogretmenligi ogrencilerinin bilgisayarla ilgili oz-yeterlik algisi. *Hacettepe Universitesi, Egitim Fakultesi Dergisi*, 21, 1–8.
- Atasoy, R. & Cemaloglu, N. (2018). Evaluation of quality policies on education in Turkish education system. *Universal Journal of Educational Research*, 6(7), 1504–1518.
- Bandura, A. (1997). Self-efficacy: toward a unifying theory of behavioral chang. *Psychological Review*, 2(84), 191–215.
- Bilici, A. (2011). *Ogretmenlerin bilisim teknolojileri cihazlarinin egitsel baglamda kullanimina ve egitimde FATIH profesine yonelik gorusleri. 5. Uluslararası Bilgisayar ve Ogretim Teknolojileri Egitimi Sempozyumu*. Elazig, Turkey: Fırat Üniversitesi.
- Cavas, B., Cavas, P., Karaoglan, B. & Kisla, T. (2009). A study on science teachers' attitudes towards ICT in education. *Turkish Online Journal of Educational Technologies*, 8(2), 20–32.
- Chai, S., Hong, H. & Teo, T. (2009). Singaporean and Taiwanese pre-service teachers' beliefs and their attitude towards ICT use: a comparative study. *The Asia Pasific Education Researcher*, 18(1), 117–128.
- Celik, H. & Kahyaoglu, M. (2007). İlkogretim ogretmen adaylarinin teknolojiye yonelik tutumlarinin kumeleme analizi. *Turk Egitim Bilimleri Dergisi*, 5(4), 571–586.
- Deniz, L. (2000). Ogretmen adaylarinin bilgisayar yasantilari ve bilgisayar tutumlar. *M.U. Ataturk Egitim Fakultesi Egitim Bilimleri Dergisi*, 12, 135–166.
- Dincer, S. (2011). *Ogretmen yetistiren kurumlardaki ogrencilerin ogrenim hayatlari boyunca bilgisayar ogrenme duzeylerinin ve bilgisayar okuryazarliklarinin incelenmesi*. Akademi Bilisim. Malatya: Malatya Inonu Üniversitesi.
- Dincer, S., Senkal, O. & Sezgin, M. (2013). *Fatih projesi kapsaminda ogretmen, ogrenci ve veli koordinasyonu ve bilgisayar okuryazarlik duzeyleri*. Antalya, Turkiye: Akademik Bilisim.
- Drucker, P. (2000). *The essential Drucker*. New York, NY: Collins.
- Elsaadani, M. (2013). Explaining the relationship between teaching staff's age and their attitude towards ICT. *International Journal of Instruction*, 6(1), 215–226.
- Elstad, E. & Christophersen, K. A. (2017). Perceptions of digital competency among student teachers: Contributing to the development of student teachers' instructional self-efficacy in technology-rich classrooms. *Education Sciences*, 7(1), 27.
- Gyamfi, S. A. (2017). Preservice teachers' attitudes towards ICT usage: a Ghanian survey. *International Journal of Education and Development Using Information and Communication Technology*, 13(1), 52–69.
- Guskey, T. R. (1988). Teacher efficacy, self-concept, and attitudes toward the implementation of instructional innovation. *Teaching and Teacher Education*, 4, 63–69.
- Isiksal, M. & Askar, P. (2003). İlkogretim ogrencileri icin matematik ve bilgisayar oz-yeterlik algisi olcekleri. *Hacettepe Universitesi Egitim Fakultesi Dergisi*, 25, 1–8.

Coban, O. & Atasoy, R. (2019). An examination of relationship between teachers' self-efficacy perception on ICT and their attitude towards ICT usage in the classroom. *Cypriot Journal of Educational Sciences*, 14(1), 136-145.

Kazan, S. & El Daou, B. (2016). The relationship between teachers' self -efficacy, attitudes towards ICT usefulness and students' science performance in the Lebanese inclusive schools 2015. *World Journal on Educational Technology*, 8(3), 277–293.

Kline, B. (2005). *Principles and practice of structural equation modelling* (2. b.). New York, NY: The Guilford.

MEB. (2010). Retrieved January 21, 2018, from, <http://fatihprojesi.meb.gov.tr/proje-hakkinda/> tarihinde <http://fatihprojesi.meb.gov.tr/proje-hakkinda/> adresinden alındı.

Ozturk, T. (2006). *Sosyal bilgiler ogretmen adaylarinin egitimde teknoloji kullanimina yonelik yeterliklerinin belirlenmesi (Balikesir ornegi)* (Doktora Tezi). Gazi Universitesi Sosyal Bilimler Enstitusu, Ankara, Turkey.

Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon*, 9, 1–6.

Rastogi, A. & Malhotra, S. (2013). ICT skills and attitude as determinants of ICT pedagogy integration. *European Academic Research*, 1(3), 301–318.

Scherer, R., Rohatgi, A. & Hatlevik, O. (2017). Students' profiles of ICT use: identification, determinants, and relations to achievement in a computer and information literacy test. *Computers in Human Behavior*, 70, 486–499.

Sunkur, M., Arabaci, I. & Sanli, O. (2012). Akilli tahta uygulamalari konusunda ilkogretim ikinci kademe ogrencilerinin gorusleri (Malatya ili ornegi). *E-Journal of New World Sciences Academy*, 7(1), 313–321.

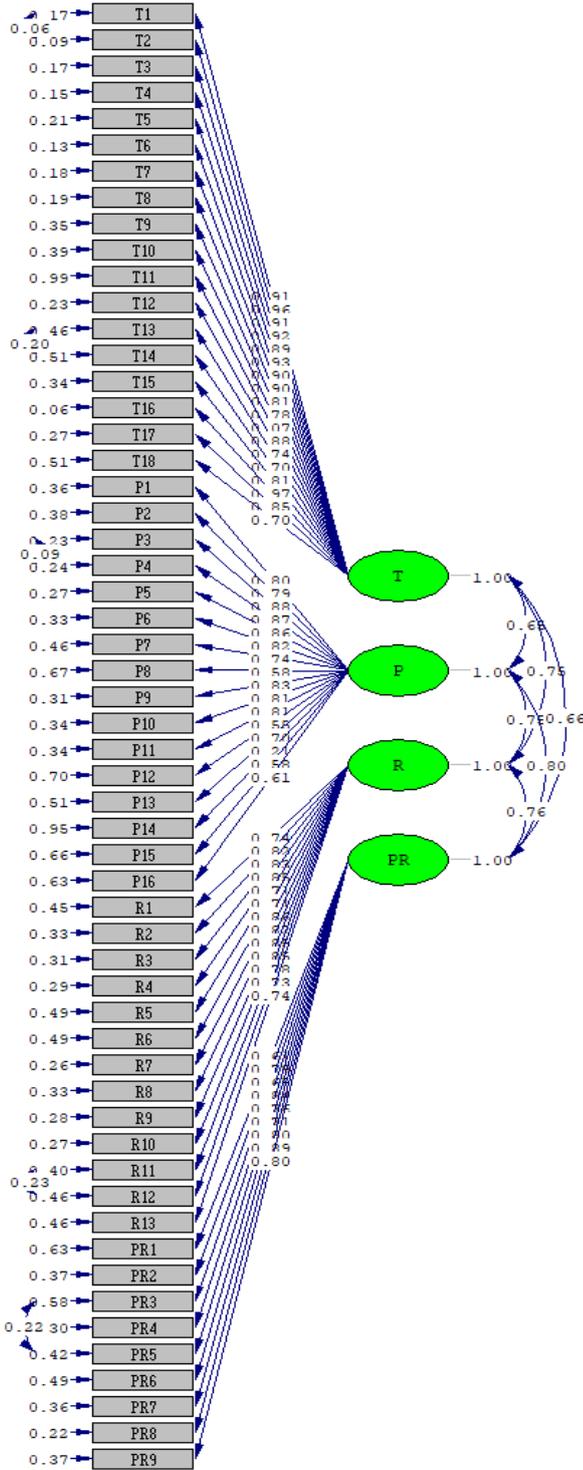
Uslu, O. & Bumen, N. (2012). Effects of professional development program on turkish teachers: Technology integration along with attitude towards ICT in education. *Turkish Journal of Educational Technologies TOJET*, 11(3), 115–125.

Yesilyurt, E., Ulas, A. H. & Akana, D. (2016). Teacher self-efficacy, academic self-efficacy, and computer self-efficacy as predictors of attitude toward applying computer-supported education. *Computers in Human Behavior*, 64, 591–601.

Yusuf, M. (2011). The impact of self-efficacy, achievement motivation, and self regulated learning strategies on students' academic achievement. *Procedia Social and Behavioral Sciences*, 15, 2623–2626.

Zimmerman, B. (2000). Self-efficacy: an essential motive to learn. *Contemporary Educational Psychology*, 25, 82–91.

**Appendix 1**



Chi-Square=7489.30, df=1473, P-value=0.00000, RMSEA=0.061