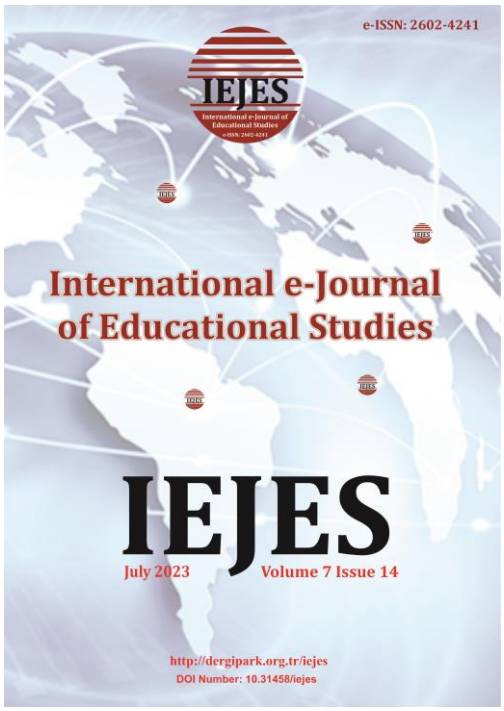

Journal name	International e-Journal of Educational Studies
Abbreviation	IEJES
e-ISSN	2602-4241
Founded	2017
Article link	http://doi.org/10.31458/iejes.1258553
Article type	Research Article
Received date	02.03.2023
Accepted date	22.05.2023
Publication date	31.07.2023
Volume	7
Issue	14
pp-pp	393-406
Section Editor	Prof.Dr. Gülay EKİCİ
Chief-in-Editor	Prof.Dr. Tamer KUTLUCA
Abstracting & Indexing	Education Source Ultimate Database Coverage List EBSCO Education Full Text Database Coverage List H.W. Wilson Index Copernicus DRJI Harvard Library WorldCat SOBIAD
Article Name	Self-Efficacy Perception of Education Faculty Members on Technology Integration

Author Contribution Statement

[1] Cansu ŞAHİN KÖLEMEN
Assist.Prof.Dr.,
Beykoz University, Turkey,

Conceptualization, literature review, methodology, implementation, data analysis, translation, and writing

Abstract

The changing needs of the student in present contemporary times do require the progress and development of the teacher competencies. Should the competencies of the teacher not develop; certain problems will be faced such as not being able to meet the needs of the society as well as not reaching the intended student-learner quality. Therefore, teachers need to have the competence to use today's information and communication technologies effectively and efficiently. From this point of view, the aim of this study is to reveal the technology integration self-efficacy perceptions of the Education Faculty members. The study universe of the research consists of 207 instructors teaching at the faculty of education in 2022-2023. Within the scope of the research, the general survey model, applicable as one of the quantitative research methods, has been used. The Technology Integration Self-Efficacy Perception scale, which had been adapted into Turkish by Ünal and Teker (2018), has also been used as the data collection tool. The data obtained in the study then have been analyzed with the SPSS 21.0 program. While determining the effects of gender, age and department variables on technology integration self-efficacy perception, independent sample t-test and one-way analysis of variance (ANOVA) test have been applied. As a result of the study, it is determined that the technology integration self-efficacy perceptions of the instructors working in the Education Faculty have been understood to be high. A significant difference has been spotted in technology integration self-efficacy perception levels among the gender, age and department variables. Accordingly, thus, the study has shown that the male instructors had had a higher technology integration self-efficacy compared to the female instructors. It has also been observed that the self-efficacy perceptions of the 65 years and older faculty members were lower. Finally, it has been determined that the teaching staff of the the Computer and Instructional Technology Teaching Department had higher technology self-efficacy perceptions compared to other departments.

To cite this article:

Şahin-Kölemen, C. (2023). Self-efficacy perception of education faculty members on technology integration. *International e-Journal of Educational Studies, 7* (14), 393-406. https://doi.org/10.31458/iejes.1258553

Research Article

Self-Efficacy Perception of Education Faculty Members on Technology Integration *

Cansu ŞAHİN KÖLEMEN [1]

Abstract

The changing needs of the student in present contemporary times do require the progress and development of the teacher competencies. Should the competencies of the teacher not develop; certain problems will be faced such as not being able to meet the needs of the society as well as not reaching the intended student-learner quality. Therefore, teachers need to have the competence to use today's information and communication technologies effectively and efficiently. From this point of view, the aim of this study is to reveal the technology integration self-efficacy perceptions of the Education Faculty members. The study universe of the research consists of 207 instructors teaching at the faculty of education in 2022-2023. Within the scope of the research, the general survey model, applicable as one of the quantitative research methods, has been used. The Technology Integration Self-Efficacy Perception scale, which had been adapted into Turkish by Ünal and Teker (2018), has also been used as the data collection tool. The data obtained in the study then have been analyzed with the SPSS 21.0 program. While determining the effects of gender, age and department variables on technology integration self-efficacy perception, independent sample t-test and one-way analysis of variance (ANOVA) test have been applied. As a result of the study, it is determined that the technology integration self-efficacy perceptions of the instructors working in the Education Faculty have been understood to be high. A significant difference has been spotted in technology integration self-efficacy perception levels among the gender, age and department variables. Accordingly, thus, the study has shown that the male instructors had had a higher technology integration self-efficacy compared to the female instructors. It has also been observed that the self-efficacy perceptions of the 65 years and older faculty members were lower. Finally, it has been determined that the teaching staff of the the Computer and Instructional Technology Teaching Department had higher technology self-efficacy perceptions compared to other departments.

Keywords: Technology integration, self-efficacy perceptions, educational technology

1. INTRODUCTION

The modern times force us to experience economic and social changes whereas such have been particularly accelerated in 21st century due to the impacts of the technology (Elçiçek & Erdemci, 2021; Genç & Eryaman, 2017). It can be seen that the technology causes economic, social and political consequences on nations (Bacanak, Karamustafaoğlu, & Köse, 2003). In parallel, the educational institutions are expected to recruit competent and equipped individuals by means of technological capabilities (Güneş & Buluç, 2017). In other words, the inevitable digital competency requirements task many responsibilities on the institutions of education. An effective education is now described as a body which can recruit individuals holding modern information and skills whereas able to use the same efficiently and even contribute to the development of the technology (Dinçer, 2003).

The concept of technology integration then affects the components of the educational system (MoNE, 2018). The students and teachers, who are the stakeholders of the technology integration, are also impacted under this interaction (Kaya, 2019). Accordingly, the teachers now shall not be solely

Received Date: 02/03/2023 **Accepted Date:** 22/05/2023 **Publication Date:** 31/07/2023

**To cite this article:* Şahin-Kölemen, C. (2023). Self-efficacy perception of education faculty members on technology integration. *International e-Journal of Educational Studies, 7* (14), 393-406. https://doi.org/10.31458/iejes.1258553

[1] *Assist.Prof.Dr., Beykoz University, cansusahinkolemen@beykoz.edu.tr İstanbul, Turkey*
Corresponding Author e-mail adress: cansusahinkolemen@beykoz.edu.tr

the transferors of the information; but much more, the individuals who themselves also effectively use the information to guide their students in line with their competencies and interests whereas providing the respective feedbacks all through the education-teaching entire process (Genç & Eryaman, 2017). Any new role acquired by the student throughout the aforementioned process then does play significant roles in the social existence of the respective individual (Günüç, 2017). Aiming to ensure the learners obtain technology awareness starting from the young ages, substantial investments are realized on educational area (Eurydice, 2020). Considering such investments on education which target the mentioned awareness and competencies to be achieved, the students are expected to have the consequent advantages in their future lives (Yenilik ve Eğitim Teknolojileri Genel Müdürlüğü, 2019).

The technology integration process follows the acquiring of the technology awareness and is described as the use technology in conjunction with the conventional learning and teaching strategies while attempting to provide any learning outcome to the student (Ramorola, 2013). The educational technology integration is defined as the technologic tools supporting the process of learning under the aim of overcoming the learning problems through the teaching process (Redmann & Kotrlik, 2004). Thus, in this process of technology integration, the teachers are expected to teach their student how to use the actual technologies and how to make gains from the same (Kent & Giles, 2017). Accordingly, in-service trainings are organized to ensure technology awareness for the teachers and to increase the digital competencies thereof (Öğretmen Yetiştirme ve Geliştirme Genel Müdürlüğü [ÖYGM], 2018). Instructors should plan very effectively how to integrate technology into their education programmes and keep this plan open to continuous change and development. For this reason, lecturers' perceptions of technology integration self-efficacy are important. In other words relates to the fact that the self-efficacy perceptions of the teachers in this area do matter while progressing their technology competencies. The literature does not include many studies related to the self-efficacy issues of the teachers on technology integration. Accordingly, this study is expected to make contribution to the literature by means of the analyzed variables herein. The outcomes of this study may provide certain existing facts in relation with the determination of the technology integration self-efficacy perceptions of the faculty members.

1.1. Conceptual Framework

1.1.1. Technology integration

The technology integration consists of a substantial and systematic process. It includes the examination of preferred technologies envisaged for the lectures as well as the sub-processes of input and outcome evaluations. Accordingly, the technology integration is desired to support the permanent learning objectives. The target of the technology integration process then focuses on the very learning qualities whereas it does not consider the amount or type of the preferred technology but expresses the reason and method of the technology use (Earle, 2002).

The technology integration in education is defined as the learners making utmost use of the new technologies to reach the targets determined in education program and the detailed utilization of the selected technologies throughout the learning process (Ramorola, 2013). In other words, the technology integration process requires the use of the technology to clarify the objectives and learning outcomes for each course or synthesizing the teaching strategies with the technology. In addition to this, ensuring the students to reach the actual sources, achievement of the student-teacher cooperation and updating the existing information are also some of the opportunities provided by the technology integration. To provide such advantages to the student; certain models exist that have been developed for the functionalization of the technology integration. One of such leading models is TPACK (Kaya, 2020).

TPACK model has been designed by Matthew Koehler and Punya Mishra. This model provides a frame of technology, content and pedagogy titles for the teachers. The frame consists of seven areas starting from technology knowledge (TK), pedagogy knowledge (PK) and content knowledge (CK) followed by pedagogy and content knowledge (PCK), technology and pedagogy knowledge (TPK), technology and content knowledge (TCK) and finally technological pedagogical content knowledge (TPACK) which is the intersection of all three main areas. The content knowledge means the general information related to the subject to be taught or learned. This component is included since the teachers need to know the nature of the information and questioning related to the respective subjects of teaching/learning (McGraw-Hill, 2020). This model is demonstrated as Figure 1.

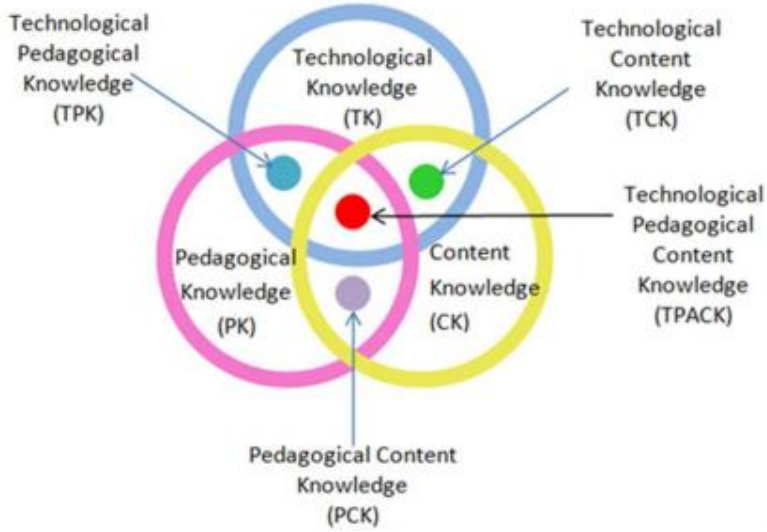

Figure 1. Technological pedagogical area knowledge

The pedagogical knowledge is the diverse information which focuses on the learning and teaching process, preferred teaching method, projected educational objectives and accepted values applicable throughout the entire process. An instructor holding the pedagogical knowledge can simply understand the information and skills of the students, learning tendencies favored by them and their attitudes towards learning. The technology knowledge includes the information related to the computer, smart phones, tablets etc. advanced technology devices (Koehler & Mishra, 2009). TPACK, since includes all these three main titles/areas, then may be used for applying the best drawn experiences on the technology integration process of the learners (Hilton, 2016).

An instructor holding the technological content knowledge will hold a control not only on the subject matter of teaching but also on the method of teaching specific to that subject since technology will be included in the methodical/teaching process. The teachers should ensure the availability of the correctly preferred technological tools and need to have a good practice on them as required by the educational objectives/outcomes. This sub-area is defined as the pedagogical content knowledge. The technological pedagogical content knowledge is the common ground for all the applicable processes under the model. An instructor having competency of the main areas will hold a good control of the technology and be capable of negative and positive signals of the learners throughout the learning process (Mishra & Koehler, 2006).

TPACK technology integration model expresses that effective technology integration may not be efficient without an existing solid common ground of all the aforementioned areas. A instructor applying the TPACK model is expected to make the correct technology selection in line with the subject matter of teaching whereas also to establish an relation between the preferred method of teaching and the selected technology. Consequently, an absolute balance must be placed among all the

model areas/titles to achieve an effective technology integration (Koehler & Mishra, 2009). Finally, building up such a balance inevitably requires the self-efficacy of the teachers.

The self-efficacy perception of the instructors is expressed as their beliefs about the level of knowledge and skills they need in the education process. Whereas, an instructor with a high level of self-efficacy may be naturally expected to demonstrate a more resistant attitude towards the incidences that may arise through the learning process and stage a more hardworking manner to ensure the learners explore themselves. The teachers with high self-efficacy levels may conduct the processes, such as technology selection, in a more efficient course. In addition, it offers new opportunities to learners by minimizing the problems that may occur. For this reason, it is important that instructors have self-efficacy perceptions regarding this process as well as self-efficacy (Kaçar & Beycioğlu, 2017). The technological self-efficacies of the teachers is being assessed by the International Society for Technology Education (ISTE). ISTE has designated the best practices and standards applicable for technology education (Sharp, 2014).

Basing on the respective literature, this study aims to clarify the self-efficacy perceptions of the Education Faculty members on the technology integration. The related sub-problems are listed below:

1. What is the level of the technology integration self-efficacy perceptions of the Education Faculty members?

2. Does the technology integration self-efficacy perceptions of the Education Faculty members;

a. demonstrate a significant difference according to the gender?

b. demonstrate a significant difference according to the age?

c. demonstrate a significant difference according to the department?

2. METHOD

This title includes the model, population and sample of the study, data gathering tools and process, and data analysis.

2.1. Research Model

This study utilizes a qualitative research method to present the technology integration self-efficacy of the Education Faculty members with regard to the several variables. The general survey model is preferred as the qualitative research method. The purpose of preferring the general survey model is to exhibit the several features of a certain group i.e. to demonstrate the differing distributions of the researched study questions over one or more variables (Fraenkel Wallen & Hyun 2012). The univariate analysis is preferred in the study to demonstrate if the technology integration self-efficacies of the faculty members differ over the gender, age and branch (department) variables.

2.2. Population and Sample

The sample of the study consists of the 207 faculty members acting under the Education Faculty in Turkey. The demographic distributions of the included participants are given in the following tables. The gender distributions are given under Table 1, age distributions under Table 2 and department distributions under Table 3.

Table 1. The gender variable distributions of the faculty members

Variables		**f**	%
Gender	Female	115	55,6
	Male	92	44,4
Total		207	100

As may be seen from Table 1, the 55,6% of the sample consists of female participants whereas the leaving 44,4% are the male participants. It is observed that the number of female participants is high.

Table 2. The age variable distributions of the faculty members

Variables		f	%
Age Interval	22-32 (1)	39	18,8
	33-43 (2)	57	27,5
	44-54 (3)	52	25,1
	55-65 (4)	32	15,4
	65 and older (5)	27	13
Total	207	207	100

As may be seen under Table 2, the age interval distributions of the faculty members in the study sample are as follows:18,8% between 22-32, 27,5% between 33-43, 25,1% between 44-54, 15,4% between 55-65 and 13%65 and older. The highest number of participants were in the category of 33-43 and the lowest in the category of 65 and over.

Table 3. The department variable distributions of the faculty members

Variables		f	%
Department	Computer and Teaching Technologies Department (1)	25	12
	Handicapped Training Teaching Department (2)	33	15,9
	Guidance and Psychological Consultancy Department (3)	28	13,5
	Pre-School Teaching Department (4)	22	10,6
	School Teaching Department (5)	19	9,1
	English Teaching Department (6)	20	9,6
	Social Sciences Teaching (7)	24	11,5
	Primary School Math Teaching (8)	36	17,3
Total	207	207	100

As can be understood from Table 3, the department distributions of the faculty members in the study sample are as follows: 12% Computer and Teaching Technologies Department, 15,9 Handicapped Teaching Department, 13,5% Guidance and Psychological Consultancy Department, 10,6% Pre-School Teaching Department, 9,1 School Teaching Department, 9,6% English Teaching Department, 11,5% Social Sciences Teaching Department and 17,3% Primary School Math Teaching Department. There are the most participants in the Primary School Math Teaching category and the least in the School Teaching Department category.

The technological device utilization periods/durations of the faculty members acting in the Education Faculty are shown under Table 4 whereas internet permanent access statuses under Table 5.

Table 4. Technological device utilization periods of education faculty members

Variables		f	%
Period	Less than 1 hour	51	24,6
	1-2 hours	69	33,3
	2-4 hours	44	21,2
	4-6 hours	31	14,9
	More than 6 hours	12	5,7
Total	207	207	100

The Table 4 shows the technological device utilization durations of the participating faculty members as: 24,6% less than 1 hour, 33,3% 1-2 hours, 21,2% 2-4 hours, 14,9% 4-6 hours and 5,7% more than 6 hours.

Table 5. Permanent access to the internet

Variables		f	%
Gender	Yes	186	89,8
	No	21	10,2
Total		207	100

Table 5 designates that the 89,8% of the participating faculty members are connected to internet permanently whereas 10,2% of the same are not connected permanently.

2.3. Data Gathering Tools

The study has used the Personal Information Form including the demographic data of the participants and Technology Integration Self-Efficacy Perception Scale which had been translated to Turkish by Ünal and Teker (2018). This scale had been developed by Wang and Woo in 2007 aiming to demonstrate the technology integration self-efficacy perceptions of the individuals. The scale is a five points Likert type and includes 19 articles. The Likert points are as follows: I definitely do not agree (1), I do not agree (2), I am neutral (3), I agree (4) and I definitely agree (5). All the articles used in the scale are positive sentences. This scale also has two sub-dimensions which are self-competency of making others use the computer technologies and self-competency of using computer technologies. Cronbach's Alpha Internal Consistency Coefficient is calculated to understand the reliability of Technology Integration Self-Efficacy Perception Scale and the result has come as 0.93. For the data analysis process, the arithmetical means of the data coming from the scale have been used. KMO and Barlett tests, which have been performed to secure the suitability of the Technology Integration Self-Efficacy Perception Scale with the factor analysis, are understood to be significant. The significant values obtained from such tests show that the data is normally distributed. Finally, the Table 6 demonstrates the parameters used for the arithmetic mean points coming from the data related to the sub-dimensions of the Technology Integration Self-Efficacy Perception Scale.

Table 6. The parameters used for the arithmetic mean points coming from the data related to the sub-dimensions of the technology integration self-efficacy perception scale

Total Scale Point Interval	Average (Mean) Scale Point Interval	Assessment Parameter
x ≤48	1.0 - 2.49	Low
48 ≤x ≤66	2.5 - 3.5	Uncertain
x >66	3.51 -5.0	High

2.4. Data Gathering Process and Analysis

In the first place, the permission of the Ethical Board has been obtained for the study. A Personal Information Form has been generated to understand the genders, ages, departments, technological device using durations, permanent internet access statuses of the Education Faculty members participating to the study. All the participants are given a general information wording to make them understand the objectives of the study. The participation to the study is volunteering based. The utilized Technology Integration Self-Efficacy Perception Scale has been generated through Google forms.

The data obtained through the research has been transferred to the computer environment by the researcher. Following, such data has been made ready for data analysis. The gathered data is checked and 12 erroneous and missing responses are not included in the analysis. To understand the distribution of the data, the coefficients of kurtosis and skewness are considered. The coefficients of kurtosis and skewness must be between +1 and -1 (George & Mallery, 2010). When examined the data of this study, it may be seen that the kurtosis and skewness values demonstrate a normal distribution i.e. a normal distribution of the data. Accordingly, the parametric analyses are performed. The independent sample t-test and one-way analysis of variance (ANOVA) have been conducted for the data analysis process. The SPSS 21.0 computer program is preferred for the analysis of data.

3. FINDINGS

This title of the study includes the findings obtained through the analysis of the study data.

3.1. Findings Related to the First Sub-Problem

The first problem of the study includes the descriptive statistics related to the self-efficacy (self-competency) of the Education Faculty members on using the computer technologies and enabling others to use the same. The findings obtained are given below. Table 7 demonstrates the descriptive analysis related to the technology integration self-efficacy perceptions of the members acting in the Education Faculty.

Table 7. The descriptive analysis results related to the sub-dimensions of the technology integration self-efficacy perceptions of the members acting in the education faculty

Sub-dimensions related to the Scale	x̄	SD	Skewness	Kurtosis
Dimension of Self-Efficacy in Using the Computer Technologies	4,21	,54	-,402	-,741
Dimension of Self-Efficacy in Making Others Use the Computer Technologies	4,29	,32	-,707	-,458
Technology Integration Efficacy Scale	4,26	,31	-,599	,558

The general average of the study data, which have been obtained to understand the technology integration self-efficacy perceptions of the faculty members acting in the Education Faculty, has been computed as 4,26 with a standard deviation of .31. The average of the first sub-dimension (self-efficacy to use the computer technologies) has been found as $\bar{x}$=4,21, and the average of the second sub-dimension (self-efficacy to make the other use the computer technologies) was $\bar{x}$=4,29. When these values are considered with regard to the technology integration self-efficacy scale evaluation criterion, it can be claimed that the self-efficacy perceptions of the faculty members are high. It can be said that the high percentage of access to the internet network of the target audience may also be effective in this situation.

3.2. Findings Related to the Second Sub-Problem

The arithmetical means of the technology integration self-efficacy perceptions of the faculty members acting in the Education Faculty demonstrate a normal distribution. To understand if the technology integration self-efficacy perceptions of the faculty members vary according to the gender, an unpaired t-test has been conducted. The results may be seen under Table 8.

Table 8. The results of the unpaired t-test related to the technology integration self-efficacy perceptions of the faculty members acting in the education faculty

Sub-dimensions related to the Scale	Gender	N	x̄	sd	T	sd	p
Dimension of Self-Efficacy in Using the Computer Technologies	Female	115	4,0	,53	-6,9	205	,000
	Male	92	4,47	,42			
Dimension of Self-Efficacy in Making Others Use the Computer Technologies	Female	115	4,21	,34	-3,9	205	,000
	Male	92	4,39	,26			
Technology Integration Competency (Efficacy) Scale	Female	115	4,1	,32	-6,7	205	,000
	Male	92	4,4	,23			

The analyses have been performed to understand if a significant difference between the technology integration self-efficacy perceptions over genders exist or not; whereas, it has been seen that a significant difference has been existing ($t=-6,9$, $p<.05$). A significant difference may be seen in

the points obtained from the general average of the technology integration efficacy/competency scale (t=-6,7, p<.05). The data shows that male faculty members have higher perception levels of self-efficacy for the use and making others use the computer technologies compared to the female faculty members. It can also be said that the fact that they are mostly connected to the internet and spend time in front of the computer are effective in their high self-efficacy perceptions.

3.3. Findings Related to the Third Sub-Problem

The arithmetical means of the technology integration self-efficacy perceptions of the faculty members acting in the Education Faculty demonstrate a normal distribution. To understand if the technology integration self-efficacy perceptions of the faculty members vary according to the age interval, a one-way variance analysis (ANOVA) has been conducted. The descriptive analysis is given under Table 9 whereas the ANOVA results may be seen under Table 10.

Table 9. The descriptive analysis of the technology integration self-efficacy perception points of the faculty members according to the age interval

Sub-Dimension related to the Scale	Age Interval	N	x̄	Sd	Min	Max
Dimension of Self-Efficacy in Using the Computer Technologies	22-32	39	4,27	,55	3,00	5,00
	33-43	57	4,11	,56	3,00	5,00
	44-54	52	4,20	,52	3,17	5,00
	55-65	32	4,41	,43	3,33	5,00
	65 and older	27	4,09	,60	3,00	5,00
Dimension of Self-Efficacy in Making Others Use the Computer Technologies	22-32	39	4,39	,23	4,00	4,92
	33-43	57	4,36	,21	4,00	4,77
	44-54	52	4,39	,23	3,85	4,85
	55-65	32	4,34	,35	3,38	4,85
	65 and older	27	3,75	,19	3,15	3,92
Technology Integration Efficacy (Competency) Scale	22-32	39	4,35	,26	3,79	4,74
	33-43	57	4,28	,26	3,74	4,84
	44-54	52	4,33	,25	3,89	4,89
	55-65	32	4,36	,31	3,37	4,79
	65 and older	27	3,85	,27	3,11	4,16

Scheffe test has been conducted to understand the source of the self-efficacy perception differences of the faculty members over the age intervals. The results of the analysis have been given under Table 10.

Table 10. The one-way variance analysis of the technology integration self-efficacy perception points over age intervals of the faculty members acting in the education faculty (ANOVA results)

		Sum of Squares	Mean of Squares	F	P	Difference	Value of Effect
Dimension of Self-Efficacy in Using the Computer Technologies	Inter-Groups	2,36	,59	2,01	,093		
	Intra-Groups	59,1	,29			No Difference	
	Total	61,4					
Dimension of Self-Efficacy in Making Others Use the Computer Technologies	Inter- Groups	9,26	2,31	37,17	,009*	5-4, 5-3, 5-2, 5-1	,148
	Intra-Groups	12,5	,062				
	Total	21,8					
Technology Integration Efficacy (Competency) Scale	Inter-Groups	5,04	1,35	18,02	,000*	5-4, 5-3, 5-2, 5-1	,786
	Intra-Groups	15,1	,075				
	Total	20,5					

According to the results of the analysis performed to understand if a significant difference exists in technology integration self-efficacy perceptions of the faculty members of different ages, a significant difference has been spotted for the total technology integration self-efficacy points (F=18,02, p<.05). A significant difference could not be spotted for the dimension of self-efficacy in using computer technologies however a statistically meaningful difference is calculated for the dimension of self-efficacy in making others use the computer technologies (F=37,17, p<.05). Considering the obtained data, it is seen that the faculty members in the group of 65 years and older have a lower self-efficacy perception level in the dimension of making others use the computer technologies compared to the other age interval groups.

3.4. Findings Related to the Fourth Sub-Problem

The arithmetical means of the technology integration self-efficacy perceptions of the faculty members acting in the Education Faculty demonstrate a normal distribution. To understand if the technology integration self-efficacy perceptions of the faculty members vary according to the department, a one-way variance analysis (ANOVA) has been conducted. The descriptive analysis is given under Table11 whereas the ANOVA results may be seen under Table 12.

Table 11. The descriptive analysis of the technology integration self-efficacy perception points of the faculty members according to the department

Sub-Dimensions related to the Scale	Department	N	x̄	Sd	Min	Max
Dimension of Self-Efficacy in Using the Computer Technologies	Computer and Teaching Technologies Department	25	4,90	,18	4,5	5,0
	Handicapped Training Teaching Department	33	3,91	,54	3,0	4,83
	Guidance and Psychological Consultancy	28	3,89	,45	3,0	4,83
	Pre-School Teaching	22	4,09	,48	3,17	4,83
	School Teaching	19	3,95	,50	3,0	4,83
	English Teaching	20	4,23	,52	3,17	4,83
	Social Sciences Teaching	24	4,37	,29	4,0	4,83
	Primary School Math Teaching	36	4,32	,48	3,0	4,83
Dimension of Self-Efficacy in Making Others Use the Computer Technologies	Computer and Teaching Technologies Department	25	4,48	,30	3,62	4,85
	Handicapped Training Teaching Department	33	4,27	,27	3,69	4,85
	Guidance and Psychological Consultancy	28	4,21	,36	3,31	4,77
	Pre-School Teaching	22	4,21	,28	3,69	4,62
	School Teaching	19	4,42	,31	3,38	4,92
	English Teaching	20	4,24	,33	3,38	4,69
	Social Sciences Teaching	24	4,41	,23	3,85	4,85
	Primary School Math Teaching	36	4,16	,34	3,15	4,69
Technology Integration Efficacy	Computer and Teaching Technologies Department	25	4,61	,19	4,05	4,89
	Handicapped Training Teaching Department	33	4,16	,25	3,58	4,68

(Competency) Scale	Guidance and Psychological Consultancy	28	4,11	,33	3,32	4,74
	Pre-School Teaching	22	4,17	,23	3,68	4,53
	School Teaching	19	4,27	,31	3,37	4,68
	English Teaching	20	4,24	,34	3,32	4,68
	Social Sciences Teaching	24	4,40	,21	3,89	4,74
	Primary School Math Teaching	36	4,21	,31	3,11	4,68

A one-way variance analysis has been conducted to understand if the technology integration self-efficacy perceptions of the faculty members acting in the Education Faculty differ over departments. Following, to express the source of the differences in technology integration self-efficacy perceptions over the departments, a Scheffe test has been performed. The results may be seen in Table 12.

Table 12. One-Way variance analysis of the technology integration self-efficacy perception points over departments of the faculty members acting in the education faculty (ANOVA results)

		Sum of Squares	Mean of Squares	F	P	Difference	Value of Effect
Dimension of Self-Efficacy in Using the Computer Technologies	Inter-groups	20,26	2,89	13,98	,000	1-2,1-3,1-4,1-5,1-6,1-7,1-8	0,66
	Intra-groups	41,20	,207				
	Total	61,46					
Dimension of Self-Efficacy in Making Others Use the Computer Technologies	Inter-groups	2,49	,35	3,67	,001	1-8	0,92
	Intra-groups	19,3	,09				
	Total	21,8					
Technology Integration Efficacy (Competency) Scale	Inter-groups	4,76	,68	8,59	,000	1-2,1-3,1-4,1-5,1-6,1-7,1-8	0,82
	Intra-groups	15,7	,07				
	Total	20,5					

The results of the one-way variance analysis (ANOVA), performed to understand if a significant difference exists in technology integration self-efficacy perception mean points (F=13,98; p>.05) of the faculty members from various faculty departments, a significant difference has been spotted for the department averages. It is seen that the faculty members under Computer and Teaching Technologies Department enjoy a higher self-efficacy in competence of using technology compared to the other departments. Besides, another significant difference has been spotted between the average points of self-efficacy in making others use the computer technologies (F=3,67; p>.05). There is a significant difference between the lecturers working in the computer and instructional technologies teaching department and the lecturers working in the elementary mathematics teaching department. In other words, the self-efficacy of the instructors in the computer technologies and teaching department to use computer technologies is higher.

4. DISCUSSION and CONCLUSION

The study has targeted to establish the technology integration self-efficacy perceptions of the faculty members acting under the Education Faculty. The conclusions for the related sub-problems are given below.

The first sub-problem of the study is "What is the level of the technology integration self-efficacy perceptions of the Education Faculty members?" When considered the average points of the faculty members acting under the Education Faculty for the technology integration self-efficacy perception scale, it may be seen that the self-efficacy perceptions of the faculty members are high. It can be claimed that such a high self-efficacy perception level may facilitate the process of adapting the new technologies to the teaching processes. In addition to that, one may say that the faculty members acting under the Education Faculty have such a high self-efficacy perception thanks to the curriculum content of their bachelor programs. The other positive factors can be listed as the awareness of the necessity to adapt for the new technologies under the competitive approach of the digital era, importance attributed to the use of teaching technologies in faculties of education, faculty members already making use of the technologies in their professional practices and the distance education experiences favored by the faculty members due to COVID-19 pandemic necessities. When the literature is scanned, some similar studies may be spotted which also demonstrate the high level of technology use and high level of self-efficacy perceptions by the teachers (Doğan & Doğan, 2022; Güneş & Buluç, 2017).

The second sub-problem of the study is "Does the technology integration self-efficacy perceptions of the Education Faculty members demonstrate a significant difference according to the gender?" The results showed that a significant difference has been existing between the genders with regard to the self-efficacy of the faculty members in using the computer technologies and making others to use the same. It may be claimed that the reason for this might be the female faculty members using the computer technologies little bit lesser than their male colleagues or their lesser interest towards the technology compared to the male faculty members. In other words, the male faculty members show a greater interest and appetite on computer technologies and also spend more time in front of the computer technologies compared to the female faculty members. When the literature is assessed, it can be seen that the technology integration self-efficacy perception varies according to the gender. A study conducted by Ünal and Teker (2013) has analyzed the self-efficacy perception on the use of the computer technologies. The results of the said study show that the male candidate teachers have a greater self-efficacy perception than the female candidate teachers. Arslan, Kutluca and Özpınar (2011) have shown, similarly, the male candidate teachers employ a higher computer competency compared to the female candidate teachers. Aydoğmuş and İbrahim (2022), TPACK competencies of teacher candidates variable according to gender was determined. Gönen and Kocakaya (2015) have researched the technological-pedagogical educational competencies of the candidate teachers. The study has proven that the male candidate teachers enjoy a higher self-efficacy perception compared to the female candidate teachers. It can be claimed that the results of this study coincide with the results of the other studies in the literature.

The third sub-problem of the study is "Does the technology integration self-efficacy perceptions of the Education Faculty members demonstrate a significant difference according to the age?" The findings from the age variable demonstrated no significant difference for the dimension of using the computer technologies; however, a significant difference has been spotted for the dimension of making others use the computer technologies. The faculty members of 65 years old and older demonstrated a lower self-efficacy perception level compared to the other age groups. The study performed by Archambault and Crippen (2009) has shown that older aged teachers had had a good control on the pedagogy and content areas however did not find themselves sufficient by means of their technology knowledge. Moreover, the teachers newly starting their professional careers are understood to be more desiring, interested and self-confident to use the computer and communication technologies in the teaching processes when compared to their experienced colleagues (Efe, 2011). In the study of Doğan and Doğan (2022), the efficacy perceptions of primary school administrators with 16 years or more of management seniority are significantly lower than the perceptions of school

administrators with 6-10 and 11-15 years of seniority. Accordingly, we may suggest that in-service trainings may be organized for the higher-aged faculty members which will, in turn, increase their self-efficacy perceptions in this area.

The fourth sub-problem of the study is "Does the technology integration self-efficacy perceptions of the Education Faculty members demonstrate a significant difference according to the departments?" The findings obtained from the Department variable demonstrate a significant difference with regard to the self-efficacies over the dimensions of using the computer technologies and making others use the same. When we examine the faculty members from different departments with regard to the technology integration self-efficacy perceptions thereof, the faculty members from the Computer and Teaching Technology Department have shown a statistically significant difference for both dimensions when compared to the faculty members from other departments. The lowest self-efficacy perception levels are spotted for the faculty members from the School Teaching Department and Primary School Math Teaching Department. When we examine the literature, it may be claimed that the faculty members from the Computer and Teaching Technologies Department demonstrate such a positive difference since they professionally prepare technology contents already in their routine and deal with different course contents related to the technology which, these in turn, might have been contributing to their higher self-efficacy perceptions, better skills and accepting manners towards the technology integration phenomenon. Azgın and Şenler (2017) in study, it was revealed that teachers' TPACK approaches did not differ according to the departments they graduated from Turan-Güntepe and Keleş (2022), in the study although some of the instructors took similar courses at undergraduate and graduate level and did similar studies on technology, it was also observed that they did not reflect technology in their lessons.Accordingly, it has been seen that the high self-efficacy perceptions demonstrated by the faculty members from the Computer and Teaching Technologies Department had been in suit with the other results in the literature (Akkoyunlu & Soylu, 2010; Kabakçı-Yurdakul, 2011). Considering the 2007 dated Higher Education Board Teacher Training Program; it can be seen that the Computer and Teaching Technologies Program has mostly focused on technologies and technology integration practices. In contrast, the other programs are understood to include only a single basic computer course in a single stage (Tatlı & Akbulut, 2017) The technology may not be deemed separate from the pedagogical professional knowledge area but which indeed is the biggest problem for the process of technology integration (Mishra & Koehler, 2006).

As a result, it was determined that the level of technology integration self-efficacy perceptions of the lecturers working in the Faculty of Education was high. In addition, it was found that their perceptions differed according to gender, age level and department.

4.1. Future Directions

Save Computer and Teaching Technologies Department, all the departments in the Education Faculties should be provided actual education technologies courses and contents related to the technology integration process instead of the existing practice of maintaining a single basic computer course.

The actual practices of education technologies should be provided to the faculty members in the form of in-service trainings. Accordingly, the technology skills of the faculty members, as well as their self-efficacy perceptions, can be supported for better.

The faculty members should be provided information about the computer software that may be integrated with the respective course contents including certain exemplifying practices.

Ethics Committee Decision

This research was carried out with the permission of Beykoz University Scientific Research and Publication Ethics Committee with the decision numbered 2023/06 dated 17.02.2023.

5. REFERENCES

Akkoyunlu, B. & Soylu, Y. (2010). Öğretmenlerin sayısal yetkinlikleri üzerine bir çalışma. [A study on the quantitative competencies of the teachers]. *Türk Kütüphaneciliği, 24*(4), 748-768.

Archambault, L. & Crippen, K. (2009). Examining TPACK among K-12 online distance educators in the United States. *Contemporary Issues in Technology and Teacher Education, 9*(1), 71-88.

Arslan, S., Kutluca, T., & Özpınar, İ. (2011). Investigating mathematics teacher candidates opinions about using information and communication technologies. *Cypriot Journal of Educational Sciences, 6*(2), 75-82. Retrieved from http://www.world-education-center.org/index.php/cjes/index

Aydoğmuş, M. & Ibrahim, M. (2022). Two approaches to investigate preservice teachers' tpack competencies and self-regulated learning skills in the Turkiye and the United States. *Journal of Computer and Education Research, 10* (20), 531-546.

Azgın, A. O. & Şenler, B. (2018). İlkokullarda görev yapan sınıf öğretmenlerinin teknolojik pedagojik alan bilgilerinin incelenmesi [Examining the technological pedagogical content knowledge of classroom teachers working in primary schools]. *Journal of Computer and Education Research, 6* (11), 47-64.

Bacanak, A., Karamustafaoğlu, O., & Köse, S. (2003). Yeni bir bakış: Eğitimde teknoloji okuryazarlığı [A new approach, technology literacy in education]. *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi,* 14, 191-196.

Doğan, A., & Doğan, İ. (2022). İlkokullarda görev yapmakta olan okul yöneticilerinin teknolojik pedagojik alan bilgisi (TPAB) yeterliliklerinin farklı değişkenler açısından değerlendirilmesi. [Evaluation of technological pedagogical content knowledge (TPACK) competencies of school administrators working in primary schools in terms of different variables]. *Journal of Multidisciplinary Studies in Education, 6*(2), 39-53.

Dinçer, M. (2003). Eğitimin toplumsal değişme sürecindeki gücü. [The power of education on the process of social change]. *Ege Eğitim Dergisi, 3*(1), 102-112.

Earle, R. S. (2002). The integration of instructional technology into public education: promises and challenges. *Educational Technology, 42*(1), 5-13.

Efe, R. (2011). Science student teachers and educational technology experience, intentions and value. *Educational Technology & Society, 14*(1), 228-240.

Elçiçek, M.. & Erdemci, H. (2021). Investigation of 21st-century competencies and e-learning readiness of higher education students on the verge of digital transformation. *Journal of Computer and Education Research, 9* (17), 80-101. http://doi.org/10.18009/jcer.835877

Eurydice. (2020). *Digital education at school in Europe.* Publications Office of the EU. On the date 20.02.2023 https://op.europa.eu/en/publication-detail/-/publication/d7834ad0-ddac11e9-9c4e-01aa75ed71a1/language-en/format-PDF/source-105790537 accessed.

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How to design and evaluate research in education* (8th. ed.). New York: McGraw-Hill İnternational Edition.

Genç, S. Z., & Eryaman, M. Y. (2017). Değişen değerler ve yeni eğitim paradigması. [The changing values and the new education paradigm]. *Sosyal Bilimler Dergisi,* 89-102.

George, D., & Mallery, P. (2010). *SPSS for windows step by step: A simple guide and reference*, 17.0 update (10th ed.). Boston: Pearson.

Gönen, S., & Kocakaya, F. (2015). Pedagojik formasyon programına katılan öğrencilerinin teknopedagojik eğitim yeterliklerinin çeşitli değişkenlere göre incelenmesi [Examination of the techno-pedagogical education competencies of the pedagogy program students under various variables]. *Eğitim ve Öğretim Araştırmaları Dergisi, 4*(4), 82-90.

Güneş, A. M., & Buluç, B. (2017). Sınıf öğretmenlerinin teknoloji kullanımları ve öz yeterlilik inançları arasındaki ilişki [The correlation between the technology utilization by the school teachers and self-efficacy beliefs there of]. *TÜBAV Bilim Dergisi, 10*(1), 94- 113.

Günüç, S. (2017). *Eğitimde teknoloji entegrasyonun kuramsal temelleri*. [The theoretical foundations of the technology integration for education]. (1th. ed.). Ankara: Anı Yayıncılık.

Hilton, J. T. (2016). A case study of the application of SAMR and TPACK for reflection on technology integration into two social studies classrooms. *The Social Studies, 107*(2), 68-73.

Kabakçı-Yurdakul, I. (2011). Öğretmen adaylarının teknopedagojik eğitim yeterliklerinin bilgi ve iletişim teknolojilerini kullanımları açısından incelenmesi [The examination of the techno-pedagogical competencies of the candidate teachers with regard to the use of information and communication technologies]. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi,* 40, 397-408.

Kaçar, T., & Beycioğlu, K. (2017). İlköğretim öğretmenlerinin öz yeterlik inançlarının çeşitli değişkenler açısından incelenmesi [Examination of the self-efficacy beliefs of the primary school teachers with regard to the various variables]. *İlköğretim Online,* 1753-1767.

Kaya, M. F. (2019). İlkokul öğretim programlarının teknoloji entegrasyonu bakımından incelenmesi. [Examination of the primary school programs with regard to the technology integration]. *Eskişehir Osmangazi Üniversitesi Sosyal Bilimler Dergisi*, 1063-1091.

Kent, A. M., & Giles, R. M. (2017). *Preservice teachers' technology self-efficacy*. *SRATE Journal*, 9-27.

Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge? *Contemporary Issues in Technology and Teacher Education*, *9*(1), 60-70.

McGraw-Hill. (2020). The TPACK framework explained (with classroom examples). On the date 18.02.2023https://www.powerschool.com/blog/the-tpack-framework-explained-with-classroom-examples/#:~:text=TPACK%20is%20a%20technology%20integration,are%20very%20different%20in%20scope accessed.

MoNE. (2018). Ortaöğretim genel müdürlüğü izleme ve değerlendirme raporu. [The observation and assessment report of general directorate for secondary schools, ministry of national education]. Ankara: Millî Eğitim Bakanlığı. On the date17.02.2023 accessed.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record,* 1017-1054.

Öğretmen Yetiştirme ve Geliştirme Genel Müdürlüğü, (2018). Mesleki gelişim faaliyetleri. https://oygm.meb.gov.tr/www/mesleki-gelisim-tanitim/icerik/7 on the date 16.02.2023 accessed.

Ramorola, M. Z. (2013). Challenge of effective technology integration into teaching and learning. *Africa Education Review*, 10(4), 654-670.

Redmann, D. H., & Kotrlik, J. W. (2004). Analysis of technology integration in the teaching-learning process in selected career and technical education programs. *Journal of Vocational Education Research,* 3-25.

Sharp, L. A. (2014). Literacy in the digital age. *Language and Literacy Spectrum,* 24, 74-85.

Tatlı, Z., & Akbulut, H. İ. (2017). Öğretmen adaylarının alanda teknoloji kullanımına yönelik yeterlilikleri [The competencies of the candidate teachers towards the use of technology]. *Ege Eğitim Dergisi, 18*(1), 31-55.

Turan-Güntepe, E. & Keleş, E., (2022). Eğitim fakültesindeki öğretim elemanlarının teknoloji entegrasyon sürecinin eş merkezli halka modeline göre değerlendirilmesi. [Evaluation of the technology integration process of the faculty of education according to the concentric ring model]. *Kırşehir Eğitim Fakültesi Dergisi, 23*(2), 1639-1690.

Ünal, E., & Teker, N. (2018). Teknoloji entegrasyonuna yönelik öz-yeterlik algısı ölçeğinin türkçeye uyarlanması. [Adaptation of the technology integration self-efficacy perception scale to Turkish]. *Anemon Muş Alparslan Üniversitesi Sosyal Bilimler Dergisi*, 973–978.

Yenilik ve Eğitim Teknolojileri Genel Müdürlüğü, (2019). eTwinning faaliyeti tanıtım kitapçığı. [Twinning initiative presentation booklet]. Ankara: T.C. Millî Eğitim Bakanlığı Yenilik ve Eğitim Teknolojileri Genel Müdürlüğü. On the date 20.02.2023 http://yegitek.meb.gov.tr/www/etwinningfaaliyetitanitimkitapcigi/icerik/2976 accessed.