THE RELATIONSHIP BETWEEN PROSPECTIVE TEACHERS' PERCEIVED IMPORTANCE OF ONLINE TEACHING COMPETENCIES AND THEIR SELF-EFFICACY BELIEFS

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ABSTRACT

Online teaching caught in-service teachers off-guard with emergency distance education and sparked interest to teacher education programs. Purpose of this study is to explore self-efficacy beliefs of prospective teachers in teaching online (SETO) and to determine the relationship between pre-service teachers' importance of online teaching competencies (IOTC) perceptions and their SETO beliefs. 101 pre-service teachers were asked to fill faculty readiness to teach online scale and the responses were analyzed through ANOVA and Pearson Correlation. The results showed a significant difference between pre-service teachers' majors, exposure to ICT-related experiences, and their SETO beliefs. In addition, there is a significant relationship between pre-service teachers' IOCT perceptions and SETO beliefs. Understanding the existing SETO beliefs of pre-service teachers is critical because it provides evidence to reassess how pre-service teachers are supported to build their online teaching competencies. The results are expected to make a significant contribution to research on establishing online teaching competencies in Turkiye and assisting teachers in understanding the value of those competencies; as a result, potential implementers may have stronger online teaching self-efficacy in their distance classrooms. The study suggests incorporating technology-based resources into teacher education courses within a digital pedagogy competencies framework to increase pre-service teachers' self-efficacy.

Keywords: Pre-service teachers, online teaching competencies, online teaching self-efficacy.

INTRODUCTION

The emergency distance education that has entered our lives because of the COVID-19 pandemic has pushed governments to close schools and provide full-time remote schooling (Carretero et al., 2021). Instructors changed the delivery mode of instruction from face-to-face to online teaching. They attempted to integrate cutting-edge technologies into their online classroom settings in order to meet the individual needs of students and achieve curriculum goals and objectives. Some in-service teachers stated that they lacked the expertise and abilities to transfer offline content to online ones (Izhar et al., 2021), and they had not previously been educated or trained for teaching online (Schleicher, 2020). Before the pandemic, distance learning was an already accessible method of teaching and learning (Marek et al., 2021); however, many instructors, including those who are senior and experienced in their field, have only recently been introduced to this schooling type with pandemic and emergency distance education. Bruder (1989) defined distance education as a style of education in which students and lecturers are physically separated, i.e., they live in

different places, and instruction is conveyed between them using various technologies. It has undoubtedly grown and changed in recent years, and many nations have recently started to implement some kind of it due to a dramatic move away from classrooms in many areas of the world; most instructors nowadays consider distance education to be a novel concept; however, the ideas that underpin distance education are over a century old, and the field's lengthy traditions are what continue to steer it in the right path (Simonson et al., 2019).

According to Pregowska et al. (2021), online teaching seems to 'become the latest norm' (p. 2). Teaching and learning have become more reliant on information and communication technology (ICT) ever than before with the pandemic (Brown, 2020). Even if the pandemic will be out of our lives, the reality of online education has now taken its place in our system. According to the report published by Education Reform Initiative (2020), the competencies related to digital pedagogy in online learning environments are now essential skills that teachers should possess.

Digital Competence

According to the report published by TEDMEM (2020), teachers' digital abilities were one of the major themes of distance education throughout the pandemic. So far, several definitions and conceptual frameworks related to digital competence have been proposed to increase teacher candidates' and teachers' digital capacities (Falloon, 2020, as cited in TEDMEM, 2021). Facer & Selwyn (2021) argue that for more than 30 years, the development of digital competence in teacher education has been considered (as cited in TEDMEM, 2021). In policy documents and studies published by international organizations, the idea of digital competence essentially comprises social-emotional components for utilizing and comprehending digital devices and digital abilities. To illustrate it, within the framework of digital competence, which is one of the Lifelong Learning Competencies prepared by the European Parliament (2006), digital competence is defined as using digital technologies with a confident and critical perspective to gain knowledge, communicate, and solve fundamental problems in all aspects of life (as cited in TEDMEM, 2021). In recent years, many nations have developed digital competency initiatives and changed their educational systems to achieve this goal (Paacola et al., 2016).

In Turkiye, digital competence is not defined as a different field within the General Competencies for Teaching Profession Report published by the Ministry of National Education General Directorate of Teacher Training and Development (2017). In the Digital Literacy Teacher's Guide (2020), which is one of the guidebooks shared by the Turkish Ministry of National Education with teachers during the pandemic, digital literacy is defined as the set of knowledge, skills, and attitudes needed to participate in digital life, to live, learn and work in a digital society (as cited in TEDMEM, 2021).

Technological Pedagogical Content Knowledge (TPACK) Framework

Online teaching is fundamentally different from traditional classroom instruction in that it is entirely dependent on technology. Before beginning their online teaching career, teacher candidates must be prepared with technological, pedagogical, and subject understanding (Koehler & Mishra, 2009). The basis of the TPACK framework is the Pedagogical Content Knowledge model proposed by Shulman (1986). The technology dimension, which is among the new century skills, was added by Koehler and Mishra to Shulman's model in 2009 and the TPACK model emerged. According to this paradigm, teachers must grasp both conventional academic subjects and digital components of the teaching subject (Gudmundsdottir & Hatlevik, 2018). TPACK is the foundation of effective technology-assisted education, requiring a grasp of how concepts are represented using technology. It addresses pedagogical strategies for teaching material that make constructive use of technology, how technology may assist students in solving some of their challenges, and how technology may be used to build on current knowledge in order to create new epistemologies or reinforce existing ones (Koehler & Mishra, 2009). Consequently, the TPACK framework develops a lens through which to view instruction that emphasizes technology. Because online classes rely on technology, teachers must comprehend the TPACK structure (Koehler & Mishra, 2009).

Online Teaching Competencies

Based on a review of literature, Martin et al. (2019) looked at four categories of online teaching competencies: course design, course communication, time management, and technical skills. Varvel (2007) stated that course objectives, instructional strategies, instructional materials, and the assessment procedures that fit with objectives are all part of the course design competence (as cited in Martin et al., 2019). Goodyear et al. (2001) highlighted the significance of interpersonal contact and interaction between the teacher and students as a course communication competence in online courses (as cited in Martin et al., 2019). Varvel (2007) argued that competent teachers are able to manage their time well so that their personal responsibilities do not interfere with their ability to teach the course (as cited in Martin et al., 2019). Finally, technical competence includes being able to take advantage of softwares, synchronous and asynchronous tools, operating systems, learning systems and tools, and web browsers (Martin et al., 2019).

Teacher education programs are designed to train competent instructors who are ready to enter the classroom and handle the challenges that come with being a new teacher (Ooyik et al., 2021). Moran & Hoy (2001) indicated that as a new teacher, being underprepared has an impact on self-efficacy, confidence, and readiness to adopt good teaching practices (as cited in Ooyik et al., 2021).

Teacher Self-efficacy

Bandura's Social Learning Theory established the notion of self-efficacy belief, which is about one's confidence in their capacity to deal with the duties, responsibilities, and problems that come with their vocation (Bandura, 1982). According to Sheldon & Byers (2002), teachers that have high levels of self-efficacy in instructional technologies employ more technology in their classrooms. In this regard, instructors with a low degree of self-efficacy in technology integration are less likely to succeed (Wang et al., 2004). In their study, Karatas et al. (2017) argued that inexperienced instructors lack confidence in their ability to successfully educate by utilizing technology in the classroom (as cited in Martin et al., 2020). Tondeur 's research study (2012) suggests that the amount and quality of pre-service technological experiences provided in teacher education programs is a critical element affecting beginning teachers' self-efficacy in use of technology (as cited in Martin et al., 2020).

PURPOSE OF THE STUDY

When most of the recent studies in the literature are examined, teachers highlighted that a lack of online teaching abilities among teachers was driven by their lack of experience (Aytac, 2021; Hassan et al., 2020; Izhar et al., 2021; Schleicher, 2020; Yastibas, 2021). In his study Aytac (2021) revealed that teachers are unsure about which web tools and resources to use, as well as which strategies to employ. Izhar (2021) found that teachers' online teaching skills were lacking because of their lack of experience. As a result, they had difficulties in developing instructional materials that could cater to students of various levels, devising appropriate methods for all students, and planning lessons. When Hassan et al. (2020) asked teachers to rank the complexity of developing e-content or using online modes of teaching, the majority of teachers rated it as extremely tough. The recent studies in the literature emphasize that teachers that were caught off-guard in emergency distance education period were unfamiliar with the concept of online teaching during their pre-service education period (Corcuera & Alvarez, 2021; Yastibas, 2021) and it shifted the arrows in the direction of pre-service education. This study intends to determine the extent to which the future implementers, prospective teachers, perceive the importance of online teaching competencies and whether they have a high self-efficacy in teaching online. Several studies conducted with pre-service teachers have recently emphasized the significance of prospective teachers' self-efficacy beliefs and technology integration (Birisci & Kul, 2019; Caner & Aydin, 2021; Chukwuemeka et al., 2019; Kim & Lee, 2018; Naz et al., 2020; Song, 2018). With the light of literature, it is crucial for preservice teachers to have a high self-efficacy belief in order to integrate technology and create efficient distant learning programs (Baser, 2021; Caka, 2021; Cooper et al., 2020).

In their experimental study Kim & Lee (2018) demonstrated that The TPACK education program proved effective in increasing preservice teachers' self-efficacy. In their research study Naz et al. (2020) advise using technology-based materials in teacher education courses linked to technology integration to improve pre-service teachers' self-efficacy about online teaching. In the study conducted by Caner & Aydin (2021) it is proposed that pre-service teacher education institutions should plan additional programs to improve pre-service teachers' technology integration skills, particularly in using technology in the classroom. Similarly, Cooper et al. (2020) noted that prospective teachers are more comfortable using computers when a full technology integration project is completed. This study aims to contribute to this growing area of research by exploring Turkish prospective teachers' self-efficacy beliefs in teaching online according to their majors, years of study and previous exposure to ICT. This study seeks to obtain data which will help to address teacher education curricula to include technology courses that may be utilized in online teaching and provide pre-service teachers with the skills, expertise, and experience needed to conceive, design, and deliver online courses (Yastibas, 2021). This work will generate fresh insight into making arrangements by adding the online teaching dimension to pre-service teachers' currently implemented curricula and internship experience. The importance and originality of this study is that it explores the relationship between prospective teachers' IOTC perceptions and their self-efficacy in teaching online. The findings related to the relationship are expected to make an important contribution to the field of teacher education and educational technology. Understanding the link between IOTC and SETO is expected to make a major contribution to research on establishing online teaching competencies and assisting prospective teachers in understanding the value of those competencies, and consequently it might help future implementers to have stronger online teaching self-efficacy in their future distance classrooms. As underlined in the TEDMEM Report (2021), when the available resources on teacher digital competencies in Turkiye are examined, it is seen that although there are guidebooks, scientific studies, and additional resources to develop these competencies, there is no Teacher Digital Competence Framework determined according to national needs at the central level. When the General Competencies for Teaching Profession (2017) published by the Ministry of National Education are examined, it is noteworthy that digital pedagogy has not been issued and the online teaching dimension has not been acknowledged. Absence of a digital pedagogical competence framework and overlooking the significance of online teaching competencies in General Competencies for Teaching Profession are the biggest impediments to determine which online teaching competencies to instill in prospective teachers during the pre-service phase and develop an action plan. Therefore, this study this study will raise awareness about updating the General Competencies for Teaching Profession published in 2017 in a way that will also address the online teaching dimension highlighted by the emergency distance education reality in 2020. Furthermore, it offers a fresh perspective on the guidance for a new framework to be created in Turkiye to define pre-service teacher online teaching competencies.

This study aimed to address the following research questions:

1. Does pre-service teachers' self-efficacy in teaching online significantly differ according to their majors, years of study, and previous exposure level to ICT?
2. Is there a relationship between pre-service teachers' importance of online teaching competencies perceptions and their self-efficacy beliefs in teaching online?

METHOD

Research Design

The research is design as quantitative research. Fraenkel et al. (2012) argue that quantitative studies seek to create correlations between variables and occasionally explain the causes of such relationships. The goal of quantitative educational research is to understand and predict relationships. The ultimate goal is the construction of laws that allow prediction rather than a comprehension of what things signify to others (Fraenkel et al., 2012). Therefore, for this study, to be able to explore self-efficacy beliefs of prospective teachers in teaching online (SETO) and to determine the relationship between pre-service teachers' importance of online teaching competencies (IOTC) perceptions and their SETO beliefs; quantitative research method is used.

For the first research question the design of this quantitative study was selected as causal-comparative research since the researcher tries to figure out 'what causes or effects differences that already exist between or among groups' of students (Fraenkel et al., 2012, p.366). The fundamental causal-comparative strategy starts with a noticeable difference between two groups and searches for plausible causes or effects. Thus, the researcher's purpose in this casual comparative research design was to see if the independent variables have an effect on the dependent variable by comparing two or more groups of people (Fraenkel et al., 2012).

The correlational research methodology was selected for the second research question because the aim is to determine the link between two variables rather than to establish a cause-and-effect explanation (Fraenkel et al., 2012).

Participants

By applying the purposive sampling method, the data were collected from 101 pre-service teachers. Fraenkel et al. (2012) argue that purposive sampling differs from convenience sampling in that researchers do not just study anyone is available, but rather utilize their judgment to select a sample that they believe will offer the data they require based on past information. Since the must and elective ICT courses were not available to first-year students at the well-known university where the data was gathered, they were excluded from the study. Thus, the target population of the study is the sophomores, juniors, and seniors.

Among the participants (*N*=101), 19.8 % of them were from the department of Computer Education and Instructional Technology (CEIT) (*n*=20), 22.8 % of them were from the department of Elementary and Early Childhood Education (ELE) (*n*=23), 29.7 % of them were from the department of Foreign Language Education (FLE) (*n*=30), and 27.7 % of them were from the department of Mathematics and Science Education (MSE) (*n*=28). Frequency table related to departments is shown in Table 1.

Table1. Departments of the Student

	Frequency	Percent	Cumulative Percent
Computer Education and Instructional Technology	20	19.8	19.8
Elementary and Early Childhood Education	23	22.8	42.6
Foreign Language Education	30	29.7	72.3
Mathematics and Science Education	28	27.7	100
Total	101	100	

Among the participants (*N*=101), 36.6 % of them were sophomores (*n*=37), 30.7 % of them were juniors (*n*=31), 32.7 % of them were seniors (*n*=33). Frequency table related to departments is shown in Table 2.

Table 2. Students' Years of Study

	Frequency	Percent	Cumulative Percent
2nd year student	37	36,6	36,6
3rd year student	31	30,7	67,3
4th year student	33	32,7	100,0
Total	101	100,0	

To understand the level of exposure to ICT, pre-service teachers were asked whether they had ever taken a course related to technology integration in education, and whether they had a training or course that has an online teaching as a dimension or component. While 12.9 % of the participants stated that they had not taken a course related to technology integration in education (*n*=13), 87.1 % of the participants stated that they had taken a course related to technology integration in education (*n*=88). While 51.5 % of the

participants stated that they had not taken a course or training that has a component or dimension regarding online teaching (*n*=52), 48.5 % of the participants stated that they had taken a course or training that has a component or dimension about online teaching (*n*=49).

According to the descriptive results, 10.9 % of the participants had a low level of exposure to ICT (*n*=11), 42.6 % of the participants had an average level of exposure to ICT (*n*=43), and 46.5 % of the participants had a high level of exposure to ICT (*n*=47). Frequency table related to exposure is shown in Table 3.

Table 3. Total Exposure of Students

	Frequency	Percent	Cumulative Percent
Low (1.00)	11	10.9	10.9
Average (1.50)	43	42.6	53.5
High (2.00)	47	46.5	100
Total	101	100	

Instrumentation

Pre-service teachers were asked to fill a 5-point Likert faculty readiness to teach online scale which was developed by Martin et al. in 2019. The scale has two constructs: perceived importance of online teaching competencies and self-efficacy beliefs in online teaching. The Cronbach's alpha was found to be 0.88 and 0.92 for the two constructs, respectively. Online teaching competencies include the skills related to course design, course communication, time management and technical. Course design competencies include constructing an online course orientation, writing quantifiable learning objectives, organizing instructional materials into modules, developing learning activities that allow students to participate, making online quizzes, designing online assignments, and managing marks online. Course communication competencies include sending out announcements to students, creating discussion forums, responding to students' inquiries quickly, providing feedback on tasks, and using web conferencing tools. Time management competencies include arranging time to develop the course prior to delivery, sparing weekly hours to facilitate the online course, allocating weekly hours to evaluate assignments, and arranging time to learn about new tactics and tools. Lastly, technical competencies include performing basic computer operations, sharing open educational resources, and utilizing online help resources for assistance.

At first, participants were asked to judge how significant each competency is for online teaching on a 5-point Likert scale ranging from 1 (not at all important) to 5 (very important). After then, they rated how well they can do the tasks based on their own assessments of their abilities on a 5-point Likert scale ranging from 1 (I can't do it at all) to 5 (I can do it perfectly).

Data Analysis

The descriptive and inferential analysis of the study were conducted using the Statistical Package for Social Science Version 28.0 (SPSS 28.0). The data were initially condensed and summarized using descriptive statistics. After then, since first research question has only one dependent variable (self-efficacy) and it has more than two groups, one-way analysis of variance (ANOVA) was utilized for the independent variable one-to-one (majors, years of study & ICT experience). An alpha level of .05 was utilized for the study. Before running one-way ANOVA, the normality assumption was checked by examining Skewness & Kurtosis values. Homogeneity assumption was checked by Levene's Test (Gravetter & Wallnau, 2018).

Correlational aspect of the study was analyzed with Pearson correlation coefficient. An alpha level of .01 was utilized for the study. The linearity assumption was checked by examining the scatter plot. (Gravetter & Wallnau, 2018).

RESULTS

Descriptive Results

The mean score of the sum of IOTC perception scores were found to be 146.61 (*SD*= 10.50). As displayed in the histogram, Figure 1, sum of importance perception levels has a negatively skewed distribution. Mean (146,61) is lower than the mode (152). On the right side of the graph, more scores are drawn, whereas on the left side, the tail of the distribution is longer.

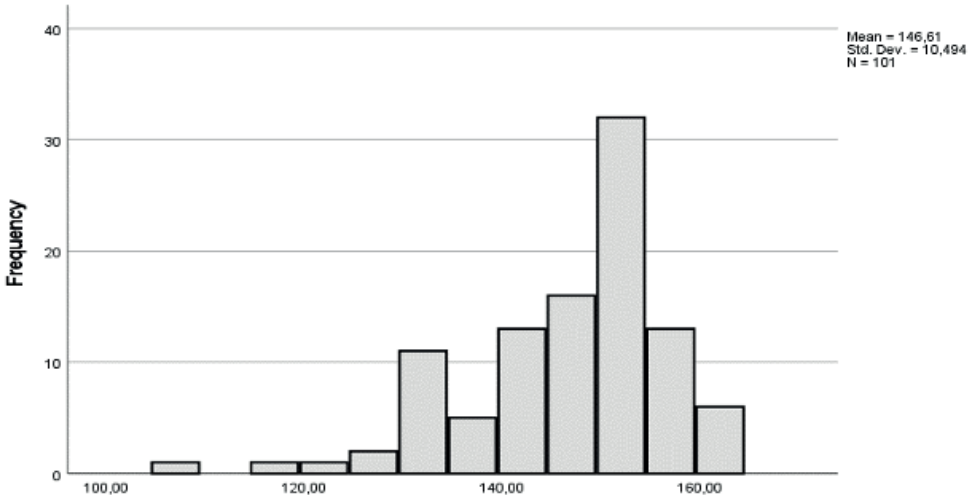

Figure 1. The mean score of the sum of IOTC perception scores

The mean score of the sum of pre-service teacher SETO scores were found to be 146.61 (*SD*= 14.81). As displayed in the histogram, Figure 2, sum of self-efficacy levels has a negatively skewed distribution. Mean (140.70) is lower than the mode (160). On the right side of the graph, more scores are drawn, whereas on the left side, the tail of the distribution is longer.

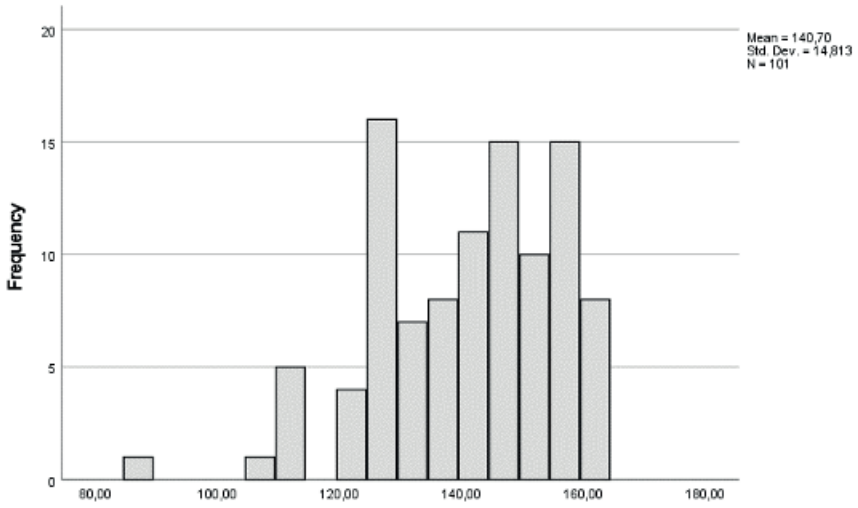

Figure 2. The mean score of the sum of pre-service teacher SETO scores

The data gathered by summing all IOTC perception levels were split into four by departments of the students. Statistics showed that mean of the sum of IOTC perception levels was slightly higher for participants from CEIT department (*M*= 151.20, *SD*= 6.80) than participants form MSE department (*M*= 150.57, *SD*= 10.72). Furthermore, mean of the sum of IOTC perception levels was slightly higher for participants from ELE department (*M*= 145.73, *SD*= 10.63) than participants from FLE department (*M*= 140.53, *SD*= 9.40). Descriptive statistics of the importance perception levels by departments is displayed in Table 4.

Table 4. Mean of Sum Perception by Departments

Departments	N	Mean	SD
CEIT	20	151.20	6.79
MSE	28	150.57	10.72
ELE	23	145.74	10.63
FLE	30	140.53	9.40

The data gathered by summing all self-efficacy levels were split into four by departments of the students. Statistics showed that mean of the sum of self-efficacy levels was slightly higher for participants from CEIT department (*M*= 148.85, *SD*= 8.80) than participants form MSE department (*M*= 146.14, *SD*= 14.16). Furthermore, mean of the sum of self-efficacy levels was slightly higher for participants from ELE department (*M*= 137.17, *SD*= 11.60) than participants from FLE department (*M*= 132.90, *SD*= 16.43). Descriptive statistics of self-efficacy in teaching online by departments is displayed in Table 5.

Table 5. Mean of Sum Efficacy by Departments

Departments	N	Mean	SD
CEIT	20	148.85	8.80
MSE	28	146.14	14.16
ELE	23	137.17	11.60
FLE	30	132.90	16.43

The data gathered by summing all IOTC perception levels were split into three by students' years of the study. Statistics showed that mean of the sum of importance perception levels was slightly higher for senior students (4^{th} year) (*M*= 148.27, *SD*= 11.15) than junior students (3^{rd} year) (*M*= 146.06, *SD*= 10.97). Finally, the mean of the sum of importance perception levels was lowest for sophomore students (2^{nd} year) (*M*=145.73, *SD*= 10.63). Descriptive statistics of the importance perception levels by years of study is displayed in Table 6.

Table 6. Mean of Sum Perceptions by Years of Study

Years of Study	N	Mean	SD
Senior	33	148.27	11.15
Junior	31	146.06	10.97
Sophomore	37	145.59	9.55

The data gathered by summing all self-efficacy levels were split into three by students' years of study. Statistics showed that mean of the sum of self-efficacy levels was slightly higher for junior students (*M*= 145.10, *SD*= 1.40) than sophomores (*M*= 137.73, *SD*= 16.90). Finally, the mean of the sum of importance perception levels was lowest for senior students (*M*= 139.91, *SD*= 12.90). Descriptive statistics of self-efficacy in teaching online by years of study is displayed in Table 7.

Table 7. Mean of Sum Efficacy by Years of Study

Years of Study	N	Mean	SD
Junior	31	145.10	13.39
Senior	33	139.91	12.90
Sophomore	37	137.73	16.90

The data gathered by summing all importance perception levels were split into three by pre-service teachers' previous experience in ICT. Statistics showed that mean of the sum of perceived importance was higher for pre-service teachers who had a high level of exposure to ICT (*M*= 149.40, *SD*= 10.46) than students who had an average level of exposure (*M*= 144.67, *SD*= 10.20). Finally, the mean of the sum of importance perception levels was lowest for students who had low level of ICT related experiences (*M*= 142.27, *SD*= 9.34). Descriptive statistics of the importance perception levels by ICT exposure is displayed in Table 8.

Table 8. Mean of Perceptions by Exposure

Total Exposure	N	Mean	SD
High	47	149.40	10.46
Average	43	144.67	10.20
Low	11	142.27	9.34

The data gathered by summing all self-efficacy levels were split into three by pre-service teachers' previous experience in ICT. Statistics showed that mean of the sum of self-efficacy in teaching online was higher for pre-service teachers who had a high level of exposure to ICT (*M*= 149.40, *SD*= 10.46) than students who had an average level of exposure (*M*= 144.67, *SD*= 10.20). Finally, the mean of the sum of self-efficacy in teaching online was the lowest for students who had low level of ICT related experiences (*M*= 142.27, *SD*=9.34). Descriptive statistics of self-efficacy in teaching online by ICT exposure is displayed in Table 9.

Table 9. Mean of Sum Efficacy by Exposure

Total Exposure	N	Mean	SD
High	47	146.66	12.12
Average	43	137.21	14.89
Low	11	128.90	14.66

Results of the First Reseach Question

Does pre-service teachers' self-efficacy in teaching online significantly differ according to their majors, years of study, and previous exposure level to ICT?

According to Levene's test, the homogeneity of variance assumption is not violated for the self-efficacy levels & students' majors. (*F Levene* (3,97) = 1.87, $p > .05$). According to Levene's test, the homogeneity of variance assumption is not violated for the self-efficacy levels & students' years of study. (*F Levene* (2,98) = 1.44, $p > .05$). According to Levene's test, the homogeneity of variance assumption is not violated for the self-efficacy levels & pre-service teachers' ICT related experiences. (*F Levene* (2,98) = .31, $p > .05$). Thus, it can be said that populations from which the samples were selected had equal variances.

Skewness and Kurtosis values for each level was examined. The first level of the first independent variable, the department of CEIT, had a normal sampling distribution with skewness of -.60 (*SE*= .51) and kurtosis of -.20 (*SE*= .99). The second level of the first independent variable, the department of MSE, had a normal sampling distribution with skewness of -.84 (*SE*= .44) and kurtosis of -.48 (*SE*= .86). The third level of the first independent variable, the department of ELE, had a normal sampling distribution with skewness of -.55 (*SE*= .48) and a kurtosis of .05 (*SE*= .94). The fourth level of the first independent variable, the department of FLE, had a normal sampling distribution with skewness of -.73 (*SE*= .43) and kurtosis of .48 (*SE*= .83). The researcher assumed that the normality assumption was not violated.

The first level of the second independent variable, sophomores, had a normal sampling distribution with skewness of -.95 (*SE*= .39) and kurtosis of .78 (*SE*= .76). The second level of the second independent variable, juniors, had a normal sampling distribution with skewness of -.68 (*SE*= .42) and kurtosis of -.40

(*SE*= .82). The third level of the second independent variable, seniors, had a normal sampling distribution with skewness of -.59 (*SE*= .41) and kurtosis of -.08 (*SE*= .80). The researcher assumed that the normality assumption was not violated.

The first level of the third independent variable, low exposure level to ICT, had a normal sampling distribution with skewness of .05 (*SE*= .66) and kurtosis of -1.13 (*SE*= 1.28). The second level of the third independent variable, average level of exposure to ICT had a normal sampling distribution with skewness of -1.14 (*SE*= 3.61) and kurtosis of 1.64 (*SE*= .71). The third level of the third independent variable, high level of exposure to ICT had a normal sampling distribution with skewness of -.61 (*SE*= .35) and kurtosis of -.85 (*SE*= .68). The researcher assumed that the normality assumption was not violated.

As it can be seen from Table 10, one-way ANOVA was conducted on self-efficacy beliefs of pre-service teachers with respect to differences in four different departments. The results indicated that there is a significant difference between pre-service teachers' majors and their self-efficacy beliefs in teaching online. F (3, 97) = 7.11, $p < .05$, $\eta 2$ =.18. According to the standards proposed by Cohen (1988), it is a large effect, and 18% of the variance in self-efficacy is explained by the pre-service teachers' majors. Scheffe post-hoc test results indicated that CEIT department significantly differs from the department of FLE (*MD*= .48). Additionally, the department of FLE significantly differs from the department of MSE (*MD*= .41). No significant difference found between the departments of CEIT and MSE. Scheffe didn't indicate a significant difference between MSE and ELE. The post-hoc test indicated a non-significant difference between the departments of FLE and ELE. Finally, post-hoc revealed that CEIT and ELE doesn't significantly differ in terms of their self-efficacy in teaching online.

Table 10. ANOVA by Departments

	Sum of Squares	df	Mean Square	F	η2
Between Groups	3.77	3	1.26	7.11*	.18
Within Groups	17.13	97	.18		
Total	20.90	100			

*$p < .05$

As it can be seen from Table 11, one-way ANOVA was conducted on the subscales of self-efficacy beliefs of pre-service teachers with respect to differences in four different departments. The results indicated that there is a significant difference between pre-service teachers' majors & their self-efficacy beliefs in course design features. F (3, 97) = 13.67, $p < .05$, $\eta 2$ =.30. According to the standards proposed by Cohen (1988), it is a large effect. The results indicated that there is a significant difference between pre-service teachers' majors & their self-efficacy beliefs in time management competence of online teaching. F (3, 97) = 13.67, $p < .05$, $\eta 2$ =.30. According to the standards proposed by Cohen (1988), it is a large effect. The results didn't indicate a significant difference between pre-service teachers' majors & their self-efficacy beliefs in course communication competence of online teaching. F (3, 97) = 2.26, $p > .05$. The results indicated that there is a significant difference between pre-service teachers' majors & their self-efficacy beliefs in technical competence. F (3, 97) = 4.24, $p < .05$, $\eta 2$ =.12. According to the standards proposed by Cohen (1988), it is a large effect.

Table 11. ANOVA of the Subscales by Departments

		Sum of Squares	df	Mean Square	F
Technical	Between Groups	10.34	3	3.45	12.76*
	Within Groups	26.19	97	.27	
	Total	36.53	100		
Course Design	Between Groups	9.00	3	3.00	13.67*
	Within Groups	21.29	97	.22	
	Total	30.29	100		
Course Communication	Between Groups	1.19	3	.40	2.26
	Within Groups	17.05	97	.18	
	Total	18.24	100		
Time Management	Between Groups	7.35	3	2.45	4.24*
	Within Groups	56.04	97	.58	
	Total	63.39	100		

*$p < .05$

One-way ANOVA was conducted on self-efficacy beliefs with respect to differences in three different years of study. The results as shown in Table 12 indicated that there is no significant difference between pre-service teachers' years of study and their self-efficacy in teaching online F (2, 98) = 1.85, $p > .05$.

Table 12. ANOVA by years of study

	Sum of Squares	df	Mean Square	F
Between Groups	.76	2	.38	1.85
Within Groups	20.14	98	.21	
Total	20.90	100		

One-way ANOVA was conducted on self-efficacy beliefs of pre-service teachers with respect to differences in three different levels of exposure to ICT. The results presented by Table 13 indicated that there is a significant difference between pre-service teachers' previous exposure to ICT and their self-efficacy in teaching online. F (2, 98) = 8.92, $p < .05$, $\eta 2 = .15$. According to the standards proposed by Cohen (1988), it is a large effect, and 15% of the variance in self-efficacy beliefs is explained by the pre-service teachers' previous ICT related experiences. Post-hoc comparisons using Scheffe test indicated a significant difference in self-efficacy between students who had low and high levels of exposure to ICT (MD= .52). Furthermore, comparison revealed that students who had an average level of exposure to ICT significantly differ from the students who had a high level of ICT experience (MD= .28). Finally, a non-significant difference was found between students who had an average level of exposure to ICT and low level of exposure to ICT in terms of their self-efficacy in teaching online.

Table 13. ANOVA by exposure levels

	Sum of Squares	df	Mean Square	F	η2
Between Groups	3.22	2	1.61	8.92*	.15
Within Groups	17.68	98	.18		
Total	20.92	100			

*$p < .05$

As it can be seen from Table 14, one-way ANOVA was conducted on the subscales of self-efficacy beliefs of pre-service teachers with respect to differences in three different levels of experience in technology integration in education. The results indicated that there is a significant difference between pre-service teachers' experience & their self-efficacy beliefs in course design features. F (3, 97) = 13.13, p < .05, η2 =.21. According to the standards proposed by Cohen (1988), it is a large effect. The results indicated that there is a significant difference between pre-service teachers' majors & their self-efficacy beliefs in time management competence of online teaching. F (3, 97) = 6.19, p < .05, η2 =.11. According to the standards proposed by Cohen (1988), it is a moderate to large effect. The results didn't indicate a significant difference between pre-service teachers' majors & their self-efficacy beliefs in course communication competence of online teaching. F (3, 97) = 1.42, p > .05. The results indicated that there is a significant difference between pre-service teachers' majors & their self-efficacy beliefs in technical competence. F (3, 97) = 8.51, p < .05, η2 =.15 According to the standards proposed by Cohen (1988), it is a large effect.

Table 14. ANOVA of the subscales by exposure levels

		Sum of Squares	df	Mean Square	F
Technical	Between Groups	5.41	2	2.70	8.51*
	Within Groups	31.13	98	.32	
	Total	36.53	100		
Course Design	Between Groups	6.40	2	3.20	13.13*
	Within Groups	23.89	98	.24	
	Total	30.29	100		
Course Communication	Between Groups	.51	2	.26	1.42
	Within Groups	17.73	98	.18	
	Total	18.24	100		
Time Management	Between Groups	7.11	2	3.56	6.19*
	Within Groups	56.28	98	.57	
	Total	63.39	100		

Results of the Second Research Question

Is there a relationship between pre-service teachers' importance of online teaching competencies perceptions and their self-efficacy beliefs in teaching online?

As displayed in Figure (3), since the points on the scatterplot closely resemble a straight line, the relationship between pre-service teachers' IOTC & SETO shows approximately linear moderate positive correlation. In positive linear correlations, when one variable increases by approximately the same rate as the other variable change (Gravetter & Wallnau, 2016). The researcher assumed that linearity assumption was assured.

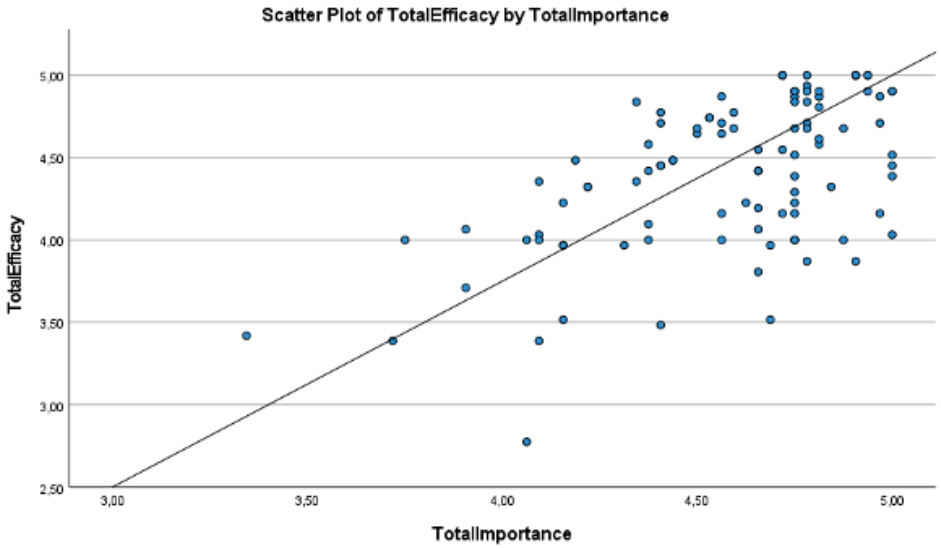

Figure 3. The Scatterplot Showing the Relationship between IOTC & SETO

As shown in Table 15, a Pearson correlation coefficient was computed to assess the linear relationship between IOTC & SETO. A positive significant correlation was detected between two variables, r=.57, n=101, p < .01. According to the guidelines proposed by Cohen (1988) it's a strong association.

Table 15. Pearson Correlation IOTC * SETO

		Total Perceived Importance	Total Self-Efficacy
Total Perceived Importance	Pearson Correlation	1	.57**
	N	101	101

p <.01

It can be concluded from the ANOVA results of the study that prospective teachers' self-efficacy beliefs in teaching online in their future distant classrooms vary significantly according to their exposure level to ICT (having a course related to technology integration in education and exposing to a training that has an online teaching component) and whether they study at CEIT department or not. When looking at the dimensions of the competencies, pre-service teachers' self-efficacy beliefs in the course design features, time management and technical competencies significantly differ. It means that prospective teachers studying at CEIT department and prospective teachers who have a good level of exposure to ICT have a significantly high self-efficacy beliefs in constructing an online course orientation, writing quantifiable learning objectives, organizing instructional materials into modules, making online quizzes, designing online assignments, managing their future students' marks online, sparing weekly hours to facilitate the online course, allocating weekly hours to evaluate assignments, arranging time to learn about new tactics and tools, performing basic computer operations, sharing open educational resources, and utilizing online help resources for assistance. Evidence from a most recent and related experimental study (Cooper et al., 2020) has similarly established that after completing the technology integration project and two semesters of online education courses, pre-service teachers' technology integration self-efficacy toward online teaching increases. At the end of the study those pre-service teachers felt more comfortable using computers, which facilitated their willingness to teach online. Those pre-service teachers felt more comfortable using computers at the end of the project, which increased their readiness to teach online.

The results of this study also revealed that pre-service teachers' years of study in their majors does not significantly contribute to their self-efficacy in teaching online. Even though a few research studies have supported this finding (Berkant, 2016; Tuncer & Tanas, 2011), more recently, Caner & Aydin (2021) have offered contradictory finding which revealed a significant correlation between the views of computer self-efficacy and grade levels among pre-service teachers.

It can be concluded from the correlational aspect of the results that prospective teachers' self-efficacy beliefs in teaching online is significantly related to their perceptions of online teaching competencies. In other words, the study revealed that if pre-service teachers perceive the importance of course design, course communication, time management and technical competencies of online teaching, they will have more high level of self-efficacy in teaching online. Even though the existing literature suffers from revealing the correlation between IOTC & SETO, as a most recent and a related study, Zhang et al. (2023) found no direct association between pre-service teachers' ICT competencies and their ICT self-efficacy. However, Martin et al. (2019) noted in their study that it is critical to incorporate components of online teaching skills such as course design, course communication, technical competency, and time management into programs and a special emphasis should be focused on competencies that pre-service teachers rated as low in importance.

DISCUSSION AND SUGGESTIONS

When most current studies in the literature were studied, teachers stated that a lack of online teaching abilities among teachers was caused by a lack of experience. (Aytac, 2021; Hassan et al., 2020; Izhar et al., 2021; Schleicher, 2020; Yastibas, 2021). Given the importance of online teaching in today's system, it is critical that beliefs and perceptions about online teaching and its competencies be cultivated and strengthened during teacher education. In this study, the data collected from pre-service teachers with various years of study, different departments and varying degrees of ICT-related experience were analyzed in terms of their self-efficacy in teaching online. The researcher concludes from the study's overall findings that pre-service teachers have high self-efficacy beliefs to teach online in their future online classrooms (M= 4.41, SD=.46). Despite the great majority of studies in the literature did not expressly discuss the online teaching dimension of self-efficacy, there are some studies that looked into ideas like technology integration, implementing computer supported education, and computer technology self-efficacy. (Berkant, 2016; Caner & Aydin, 2021; Topkaya, 2010; Tuncer & Tanas, 2011). At first glance, a gain in SETO may be expected to increase in tandem with prospective teachers' years of study. However, the results of the years of study issue showed that preservice teachers' self-efficacy beliefs did not differ significantly on any dimensions of the competencies. The finding of this study regarding the insignificant years of study difference on all of the subscales of the online teaching self-efficacy is consistent with the finding of prior study which revealed insignificant differences among the freshman, sophomore, junior and senior group of preservice teachers in their self-efficacy beliefs and attitudes towards implementing computer supported education (Berkant, 2016). In their investigation of the computer self-efficacy of pre-service teachers, Tuncer & Tanas (2011) found that there was no appreciable change in prospective teachers' evaluation of their own computer self-efficacy across their years of study. However, in their study Caner & Aydin (2021) discovered that there was a statistically significant variation in pre-service teachers' self-efficacy in using computer technology across grade levels. Similarly, in her research, Topkaya (2010) found a correlation between the views of computer self-efficacy and grade levels among pre-service teachers. Unal (2013) also found that there is a significant difference between years of study in terms of pre-service teachers' self-efficacy beliefs of using computer technologies.

The significant effect of studying at CEIT department, having a course related to technology integration in education and exposing to a training that has an online teaching component can be explained by the fact that students' good level of exposure to ICT. Tekinarslan (2011) also found that CEIT program participants had significantly higher self-efficacy mean scores in online technologies than counterparts from other programs. Tekinarslan (2011) argued that when compared to students in other programs, students in the CEIT program may have more computer and Internet experience, which may be the cause of their higher self-efficacy mean scores. Demiralay & Karadeniz (2010) contended that computer use experience had a beneficial effect on prospective teachers' self-efficacy. Akkoyunlu & Kurbanoglu (2003) found a difference between the students' self-efficacy perceptions and their computer self-efficacy perceptions for the benefit

of CEIT. The difference stems from the fact that the students of the CEIT have more knowledge and experience in ICT than the students of the other departments (Akkoyunlu & Kurbanoglu, 2003). Cooper et al. (2020) has similarly proven that pre-service teachers' technology integration self-efficacy toward online teaching increases after finishing the technology integration project and two semesters of online education courses. Those pre-service teachers felt more comfortable using computers at the end of the study, which increased their readiness to teach online. Additionally, the results of Caner & Aydin's (2021) study showed that the pre-service teachers' self-efficacy with regard to integrating technology was significantly influenced by their majors. Similarly, Keser et al. (2015) revealed that based on the department pre-service teachers are studying, there were substantial differences in their TPACK proficiency levels and self-efficacy perception levels towards technology integration. Conversely, Unal's study (2013) discovered that there are no appreciable departmental differences in the mean scores of pre-service teachers' self-efficacy perceptions for technology integration.

A correlational aspect of the study showed that pre-service teachers' self-efficacy in teaching online was substantially correlated with their understanding of the significance of online teaching competencies. Relatively little research has been carried out on significance of online teaching competencies, and even less on its' relationship with self-efficacy. According to Martin et al. (2019), it is crucial to include components of online teaching competences such course design, course communication, technical proficiency, and time management to the programs. Particular focus should be placed on competencies that pre-service teachers evaluated as being of low value. The findings highlight the significance of defining and imparting online teaching competencies in teacher education in Turkish higher education institutions, its implementation in different departments, and the role of online teaching during school practicum. It is assumed that it must be a required subject across disciplines in teacher education programs to boost confidence and competence in all areas of online teaching. The practical recommendations and suggestions for further research are also listed below.

- Given the considerable impact that extensive ICT exposure has on pre-service teachers' confidence in their ability to teach online, it is important to create environments and conditions that allow for adequate interaction with ICT for educational purposes.
- Teachers-in-training should experience the educational uses of technology through their education, and academics who play a part in teacher education should use technology successfully in their lessons.
- Since a significant correlation was found between importance of competencies perception and self-efficacy, it is necessary to create a framework for digital pedagogy competencies which may include course design, course communication, time management, and technological skills. Consequently, elevating their sense of importance can help teachers feel more confident in their abilities.
- The study's correlational component does not offer a justification for the connection. The relationship could have a number of causes, but the audience is unaware of these factors. A mixed model utilizing qualitative data collection methods like interview can be applied in future investigations.
- In their book Fraenkel et al., 2012 state that the likelihood of a subject characteristics threat is the most serious threat to the internal validity of a causal comparative research studies. Because the student groups are constructed without the researcher's manipulation, there is always the possibility that the groups are not equivalent on one or more factors (Fraenkel et al., 2012). Furthermore, the main disadvantage of purposive sampling is that the researcher's judgment may be incorrect—he or she may be incorrect in assessing the representativeness of a sample or in their knowledge of the information required (Fraenkel et al., 2012). For further research, the researchers may form groups by random sampling with an experimental design to increase the generalizability of the findings.

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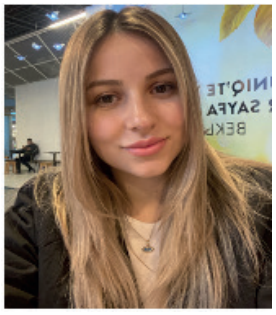

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