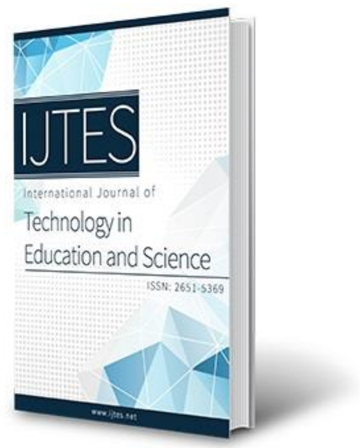


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# Investigation of Special Education Teachers' Technology Integration Self-Efficacy Levels

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# Investigation of Special Education Teachers' Technology Integration Self-Efficacy Levels

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## Abstract

The aim of this study is to determine the technology integration self-efficacy of special education teachers. Within the scope of the study, it was examined whether the technology integration self-efficacy of special education teachers varies according to gender, professional seniority, in-service training and postgraduate education variables. Two measurement tools, technology integration self-efficacy scale and personal information form, were used in the study. The study was conducted with 206 special education teachers working in public and private special education institutions in different cities in Turkey. The results show that special education teachers' technology integration self-efficacy is at a moderate level. When it was examined whether the technology integration self-efficacy of special education teachers differed according to gender and professional seniority, no significant difference was found in the self-efficacy of the participants according to these two variables. Male special education teachers and those with low professional seniority had high technology integration self-efficacy scores. Finally, in-service training and post-graduate education of teachers appear to be an important factor in their technology integration competencies. Teachers who received in-service training or postgraduate education were found to have a very high level of technology integration self-efficacy perception.

## Introduction

Educational technology includes the analysis, design, development, evaluation, implementation and management of instructional systems and other learning environments that contribute to the learning and development of mind, body and spirit. Educational technology encompasses theoretical research, instructional design and models, learning and cognition, instructional strategies and tactics, visual design, media design and interaction design, usability testing and evaluation, educational systems design, production and management systems, and human performance improvement (Song & Kidd, 2010; Thomas & Knezek, 2008). The key issue is whether existing schools can adapt the new power of technology-driven learning for the next generation of public schools. If schools fail to successfully integrate new technologies into what it means to be a school, a long definition of education, with education developed over the last 150 years, will be transformed into a world where more affluent students continue their learning outside the public school (Cohen, 2013; Collins & Halverson, 2009).

Technology-supported educational environments support the visual, hearing, reading, writing, academic, social and communication skills of people with special needs in accordance with the type of their disability and provide them with independent life skills. It enables them to learn the intended information easily, permanently and quickly. The learning process can be more effective and enjoyable when learning environments supported by multimedia and interaction elements are used. Visual, auditory and tactile stimuli can be used to create a learning experience through different options (Alnahdi, 2014; Aydogan & Koc, 2022; Vaughn, 2021; Vela & Miles, 2022; Wiederhoeft, 2022; Woodward, & Rieth, 1997).

In the world where the relationship between technology and education is becoming increasingly widespread, information and technology are gradually developing. When we look at the world in general, many changes and developments are observed in educational policies with technology, and in response to this, project studies have gained momentum (Olakanmi et al., 2020). Nowadays, computers and the internet have a great weight in all educational environments. Such technological devices are very powerful devices that facilitate individual learning. With the developing technology, the role of the teacher in the classroom is also changing. The teacher and textbooks alone are no longer seen as the source of knowledge. The teacher has become the actor who manages the process of accessing information (Heinich, Molenda, Russell, & Smaldino, 2002).

The skills that teachers need to acquire are concentrated on issues such as which technological applications in the teacher's own branch are sufficient in which subjects and what they will provide to students, rather than how educational technologies work, what they can do, how they are programmed. Technology-supported education is not a substitute for teaching, but rather a tool to assist in teaching. These tools will make learning easier and more enjoyable (Sünbül, Gündüz & Yılmaz, 2003). The success of the use of technology in the classroom depends on how prepared the teacher who will use it and have it used is. In order for instructional technologies and their implementation to be successful, it is necessary to be able to realize teacher training programs that will be functional and continuous, based on quality standards. Teachers should be trained in a model that includes basic technology use, integration of technology into the curriculum and technological leadership. As a result, teachers will go through phases such as introduction, acceptance, adaptation, decomposition and exploration (Kibici, 2022).

In many countries, education and rehabilitation centers that supplement traditional educational methods with information technology are achieving very positive results with children and young people with physical and mental disabilities. Educators need to grasp the potential of technology to help children to solve problems and to collaborate with children. Goldman and Pelligrino (1987) emphasized that innovative instructional technologies have significant potential for enhancing educational experiences and facilitating the learning of children with disabilities. They stated that these technological innovations, as seen in the education of normal children, create a learning environment that responds to the needs of disabled children by complementing the educator and the computer. There are many reasons that prevent disabled children from being active in education. One of these reasons is that the comprehension capacities of these children are very different from each other.

The computer, which provides individualized education to a certain extent by establishing a relationship with the child individually, can ensure the active participation of each disabled child in the learning process (Detterman & Thompson, 1997). Children with disabilities should receive individualized education with the help of educational materials and methods appropriate to their characteristics and skills. Individual education is more important in special education. Because the level differences between children with disabilities are higher. In the education of children with disabilities, as in every field of education, the educational environment, personnel, selected educational methods as well as the materials used are of great importance. The tools and materials used in the education of mentally handicapped children are not very different from those used in the education of other children. What is important is the suitability of the material used for educational purposes (Blackhurst, 1997; Wallace & Georgina, 2014).

It is widely known that in our traditional education, the child plays the role of a passive receiver. This phenomenon, which is often voiced and complained about, is called a deficiency of the educators responsible for implementation, not of our understanding of education. In other words, it is suggested that educators can solve this problem if they wish. However, the inefficiency of traditional educational technology inevitably leads to larger class sizes and lower achievement levels. Faced with a larger number of children, an unmotivated educator is unlikely to ensure their active participation in the work. However, the importance of active participation in learning is undeniable (Castronova, 2002; Hooper & Rieber, 1995).

In addition to using instructional technologies as a kind of learning tool, educators working in this field also use them to motivate children to learn, to practice academic skills, and as a reward after work. In special education, instructional technologies are used to support children's academic skills and support many developmental areas such as hand-eye coordination, small muscle motor skills, imitation and language development (Aslan, 2016; Clark, 2000) .When the researches in the literature are examined, it is seen that in recent years, the issue of determining the effectiveness of technology in education has moved away from the issue of determining the effectiveness of technology in education, and it is discussed how technologies that are determined to be effective today can be used more qualified and more efficiently in teaching environments (Hsu & Hargrave, 2000; Lee & Winzenried, 2009). From this perspective, it is possible to say that the importance of teachers' competence and use of technology in teaching environments is emphasized (Kibici, 2022). There is a view that the more teachers integrate technology into their course content, the more the benefits of technology are reflected to students (Colomo-Palacios, Paniagua-Martin, Garcia-Crespo & Ruiz-Mezcua, 2019). Considering this situation, it is seen that the importance of studies on teachers' integration and use of technology in their fields is increasing in the field of special education. In some studies, it is seen that technology integration and use were conducted with special education teachers working in different special education settings (King-Sears & Evmenova, 2007; Reel, 2009; Sydeski, 2013).

Technology in education increases the importance of its integration and teachers need to update their competencies and make changes in their curriculum and teaching in order to provide quality education (Noroozi & Sahin, 2022a, 2022b; Sarıkaya, 2022). Teacher efficacy is an important construct in teacher education and is crucial for determining how teacher self-efficacy develops, what components it consists of, what factors contribute to strong and positive teacher efficacy, and how and which educational programs should be developed to develop a high level of teacher efficacy (Pajares, 1997). In addition, teachers' efficacy beliefs draw attention as an important variable in creating an efficient school or restructuring schools" (Hoy, Woolfolk, 1993; Pajares & Miller, 1994). "A teacher is an extraordinary power and expert in forming human behaviors as a professional person who has socio-cultural, economic, scientific and technological dimensions related to the education sector, based on special expertise knowledge and skills in the field" (Alkan, 2000). Teachers' knowledge, skills and attitudes towards any subject enable them to play a very effective role in the learning process. When teacher competencies are also expressed as qualifications, quality learning takes place with quality attitudes and behaviors.

With the developing technology, the role of the teacher in the classroom is also changing. The teacher and textbooks alone are no longer seen as the source of knowledge. The teacher has become the actor who manages the process of access to knowledge (Heinich, Molenda, Russell, & Smaldino, 2002). However, there is a linear relationship between the implementation of information communication and technology (ICT) in education and teacher efficacy. While educators and students are familiar with traditional technological teaching aids such as Smartboards and PowerPoint, significant problems arise in translating and integrating versatile new technologies into practice (Nikolopoulou & Gialamas, 2016; Guillén-Gámez et al., 2018). Moreover, the changes in the teaching-learning process in recent years have raised the need for teachers in particular to gain competence in using technologies in their practice (Daniela et al., 2018).

Many studies draw attention to the importance of technology integration in pedagogical practices and imply that it facilitates not only the students but also the teacher in the learning process (Akram et al., 2021; Salam et al., 2019). Islam et al. (2019) state that the use of technology in teaching makes the teacher competent in pedagogical and content areas in classrooms and helps students learn efficiently using technological tools. Many studies emphasize the advantages of technology use for teachers. For example, Vongkulluksn et al. (2018) emphasize that teachers who are successful in using technology prefer to spend more time teaching in their classrooms. Moreover, teachers' technological competencies contribute to their performance and easy adaptation to other teaching strategies and approaches.

Oliva-Córdova et al. (2021) identify that the use of technology in teaching practices enables students to learn effortlessly; however, its effective implementation often depends on teachers' technological and pedagogical competencies. The importance of these competencies and knowledge in teaching practice has been identified by various studies. Ifinedo et al. (2020) show that teachers' technological knowledge contributes significantly, either explicitly or implicitly, to the successful integration of ICT, while teachers' ICT pedagogical practices are found to be the lowest predictor of technology integration. The results also suggest the inclusion of professional training to help teachers integrate ICT efficiently by increasing their technological competence. Brinkley-Etzkorn (2018) conducted a research to investigate the impact of teachers' training programs on online teaching activities. The findings revealed that teachers' technological integration skills contributed significantly to their teaching competencies and curriculum design. Teaching with new technologies requires digital competencies, but it also requires different pedagogical approaches than, for example, face-to-face teaching (Gurley, 2018).

Technological competence includes all the main components such as knowledge (technological, pedagogical, and content), skills, and attitudes (Voogt et al., 2015). There have been many studies investigating teachers' technological and digital competencies through all the determinants of TPACK in various countries (i.e., Lin et al., 2013; Scherer et al., 2018; Ortega-Sánchez & Gómez-Trigueros, 2019; Castéra et al., 2020). However, to the best of our knowledge, there is a limited number of studies that aim to examine the technological integration and competencies of teachers working in special education institutions in Turkey. In this context, this study examined the technology integration competencies of special education teachers in terms of some variables. In line with this purpose, answers to the following questions were sought in the study:

-What is the level of technology integration self-efficacy perceptions of special education teachers?
-Do special education teachers' technology integration self-efficacy perceptions differ according to gender and professional seniority variables?
-Do special education teachers' technology integration self-efficacy perceptions differ according to the variables of receiving in-service training and graduate education?

## Methodology

This study is a quantitatively designed, survey model research to determine the self-efficacy of special education teachers working in the 2022-2023 academic year towards technology integration. Quantitative method is also called empirical approach or quantitative approach. The quantitative approach argues that science deals with objective reality and non-science deals with subjective reality. Objective reality is assumed to consist of data obtained from observations or measurements independent of value judgments and personal interpretations. Therefore, researchers conducting quantitative research make great efforts to avoid adding their own value judgments and personal interpretations to the data collection and analysis processes (Fry, Chantavanich & Chantavanich, 1981). Quantitative researches are studies that use numerical data and reveal absolute and generalizable results.

In quantitative research, data are collected numerically. Statistical and mathematical methods are used for data analysis. The result is considered to be definitive. If the research includes descriptions and generalizations, it may be suitable for quantitative research. Surveys and experiments are the main techniques used to collect data in quantitative research. For this purpose, in order to make generalizations, the sample should be large and the data collection tools should be structured (Barreiro & Albandoz, 2001). In terms of general characteristics, quantitative researches are studies that collect numerical data from the sample formed from the universe in order to verify the sub-problems or hypotheses put forward, reveal the causes and consequences of the relationships between social events and concepts with the collected data, analyze the data mathematically and generalize the findings. In this context, the study comparatively examined the technology integration competencies of teachers working in special education institutions in different cities according to gender, professional seniority, in-service training and postgraduate education variables.

The participants of the study consisted of 226 special education teachers working in the 2022-2023 academic year. Convenient sampling method, one of the non-random sampling methods, was determined as the sampling method.

Queirós, Faria & Almeida (2017) defined convenience sampling method as a method that aims to prevent loss of time, money and labor. When the distribution of the special education teachers reached at the end of the implementation process was analyzed according to the gender variable, it was determined that there were more women n=108 (52.42%). The rate of male participants was n=98 (44.57%). In terms of education, which is another variable, the number of teachers with bachelor's degree is n=176 (85.43%) and the number of postgraduate graduates is n=30 (14.56%). Of the teachers participating in the study, n=105 were working in special education classrooms, n=80 were working in special education practice schools, and n=26 were working in special education vocational schools. The seniority of the participants was distributed as 0-5 years n=44 (21.34%), 6-10 years n=58 (28.16%), 11-15 years n=54 (26.21%) and 16+ years n=50 (24.27%). The highest number of participants were female according to gender, teachers with bachelor's degrees according to education level, teachers working in special education classes according to school type, and teachers with 6-10 years of professional experience in the seniority variable.

## Data Collection

In this study, the "Technology Integration Competency Scale" and "Personal Information Form" developed to collect data were applied. Necessary explanations were made to the data collection tools and special education teachers were asked to fill in the data collection tools accordingly. In official special education institutions, data collection tools were sent from the Provincial Directorate of National Education to schools through District Directorates of National Education, and the data collection tools completed in schools within 15 days were collected at the Provincial Directorate of National Education through District Directorates of National Education. On the other hand, the measurement tools were delivered one by one to the special education personnel working in rehabilitation centers and other private special education institutions by the researcher.

### *Personal Information Form*

The personal information form was prepared by the researcher. First of all, the form includes a brief explanation about the purpose of the research and the issues to be considered in the application. For the safety of the research, no names were taken from the participants. In the Personal Information Form, there are fifteen questions about the type of special education institution where the teachers work, the organization to which the institution is affiliated, the service area of the special education institution they work in, their gender, marital status, age, whether they are administrators or not, their job branches, the field they graduated from, their professional seniority, whether they received computer education at the university, whether they attended a computer course organized by the Ministry of National Education or in their institutions, whether they have a computer at home, whether they use the internet or not, and whether they feel competent in computer use.

### *Self-Efficacy Perception Scale for Technology Integration*

In the study, a five-point Likert-type scale developed by Wang, Ertmer, and Newby (2004) was used to measure teachers' technology integration competencies. The scale consists of 19 items and two subscales. All of the items in the scale form consist of positive items. The pre-service teachers responded to a 5-category rating scale expressed as "never", "rarely", "sometimes", "most of the time" and "always". The data collection tool was designed to be filled in with paper and pencil method and all findings were obtained in this context. Some suggestions can be made regarding the scoring of the scale. Comparison and correlational analyses (with the demographic or dependent variables to be used in the research) can be made with the total scores obtained from the scale or the total scores related to the sub-dimensions. As a result of the EFA, a two-factor structure with 19 items was obtained. The sub-dimensions of the scale were determined as using computer technologies and making computer technologies available. The total explained variance of the scale was calculated as 53.11%. The appropriateness and accuracy of the EFA model was tested with CFA. The Cronbach's Alpha internal consistency coefficient of the structure confirmed by CFA was calculated as .910. The Cronbach's Alpha internal consistency coefficient for the first sub-factor of the scale was .90 and the Cronbach's Alpha internal consistency coefficient for the second sub-factor was .88. Since each factor correlated well with each other and with the whole scale, measurements can be made by taking the total scores for each sub-factor or by taking the total scores for the whole scale. A high score on the scale indicates that teachers perceive technology integration competencies at a high level.

**Data Analysis Techniques**

Before analyzing the research data, some assumptions were tested in terms of measurement data. The distribution of the scores obtained from the technology integration competency scale for special education teachers was analyzed based on skewness and kurtosis coefficients. In order to meet the assumption of normal distribution, it is sufficient for the skewness and kurtosis coefficient to be within the range of ±1.5 (Tabachnick & Fidell, 2007, p 79). In this study, it was observed that the calculated skewness and kurtosis coefficients were within the specified range and it was observed that the scale data met the assumption of normal distribution. In this context, parametric statistical techniques were used to analyze the technology integration competencies of special education teachers according to the variables of gender, professional seniority, school type and postgraduate education. One-way analysis of variance was used to determine the differentiation of special education professionals' perceptions of technology integration competencies according to their demographic characteristics, and Tukey test and unrelated group t-test calculations were performed to find the source of the difference in cases where there was a difference.

## Findings

Table 1 shows the descriptive statistics findings regarding the scores of the participant special education teachers on the two sub-dimensions and total scores of the technology integration competency scale. According to the analysis, the participants obtained values of 3,46±0,70 from the Self-Efficacy in Using Computer Technologies subscale; 21,50±5,80 from the Self-Efficacy in Using Computer Technologies subscale; and 13,88±4,21 from the normative commitment subscale. According to the weighted average values, it is seen that the employees have a high level of affective commitment, while their continuance and normative commitment perceptions are above average.

Table 1. Descriptive Statistics of Special Education Teachers’ Technology Integration Competency Scores

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Self-Efficacy to Use Computer Technologies | 206 | 1.17 | 5.00 | 3.46 | 0.70 |
| Self-Efficacy in Using Computer Technologies | 206 | 2.00 | 5.00 | 3.32 | 0.55 |
| Self-Efficacy Towards Technology Integration | 206 | 2.08 | 4.50 | 3.39 | 0.45 |

Table 2 shows the results of the comparison of the mean scores of special education teachers' technological integration competence scale and its sub-dimensions according to gender variable. t values of 0.71 were calculated between the mean scores of male and female teachers on the Self-Efficacy in Using Computer Technologies subscale, 3.56 on the Self-Efficacy in Using Computer Technologies subscale and 1.55 on the total scores of the scale. According to the t values, it was seen that there was no significant difference in terms of gender variable in special education teachers' computer use self-efficacy and technological integration competencies ($p>0.05$). However, a significant difference was found in terms of self-efficacy in using computer technologies according to gender variable ($p<0.05$). According to the averages of the groups, male special education teachers' Self-Efficacy in Using Computer Technologies was found to be significantly higher.

Table 2. t Test Analyses on the Comparison of Special Education Teachers' Technology Integration Competency Scores According to Gender

| | Gender | N | Mean | Std. Deviation | t | P |
|---|---|---|---|---|---|---|
| Self-Efficacy to Use Computer Technologies | Female | 108 | 3.49 | 0.72 | 0.71 | 0.48 |
| | Male | 98 | 3.42 | 0.67 | | |
| Self-Efficacy in Using Computer Technologies | Female | 108 | 3.19 | 0.47 | -3.55 | 0.00 |
| | Male | 98 | 3.46 | 0.59 | | |
| Self-Efficacy Towards Technology Integration | Female | 108 | 3.34 | 0.45 | -1.55 | 0.12 |
| | Male | 98 | 3.44 | 0.46 | | |

Table 3 shows the results of the comparison of the mean scores of special education teachers on the technological integration competence scale and its sub-dimensions according to the professional seniority variable. F values of 4.04 were calculated between the mean scores of teachers with different professional seniority on the Self-Efficacy in Using Computer Technologies subscale, 15.96 on the Self-Efficacy in Using Computer Technologies subscale and 13.55 on the total scores of the scale. According to the F values, it was seen that there was a significant difference in terms of professional seniority variable in special education teachers' computer use self-efficacy, computer use competencies and technological integration competencies ($p<0.05$). According to Tukey test analysis, the Technology Integration Self-Efficacy of special education teachers with a professional seniority of 10 years or less was found to be significantly higher than their colleagues with a seniority of 16 years or more.

Table 4 shows the results of the comparison of the mean scores of special education teachers' technological integration competence scale and its sub-dimensions according to the variable of receiving in-service training. t values of 5.48, 4.18 and 6.79 were calculated between the mean scores of teachers who received in-service training and those who did not receive in-service training on the Self-Efficacy in Using Computer Technologies subscale, 4.18 on the Self-Efficacy in Using Computer Technologies subscale and 6.79 on the total scores of the scale, respectively.

Table 3. F Test Analyses on the Comparison of Special Education Teachers' Technology Integration Competency Scores According to Their Professional Seniority

| | Work years | N | Mean | Std. Deviation | F | p |
|---|---|---|---|---|---|---|
| Self-Efficacy to Use Computer Technologies | 0-5 years | 44 | 3.76 | 0.60 | 4.04 | 0.01 |
| | 6-10 Years | 58 | 3.43 | 0.79 | | |
| | 11-15 Years | 54 | 3.38 | 0.58 | | |
| | 16 years and above | 50 | 3.30 | 0.72 | | |
| | Total | 206 | 3.46 | 0.70 | | |
| Self-Efficacy in Using Computer Technologies | 0-5 years | 44 | 3.71 | 0.56 | 15.96 | 0.00 |
| | 6-10 Years | 58 | 3.05 | 0.28 | | |
| | 11-15 Years | 54 | 3.21 | 0.54 | | |
| | 16 years and above | 50 | 3.40 | 0.58 | | |
| | Total | 206 | 3.32 | 0.55 | | |
| Self-Efficacy Towards Technology Integration | 0-5 years | 44 | 3.74 | 0.48 | 13.56 | 0.00 |
| | 6-10 Years | 58 | 3.24 | 0.42 | | |
| | 11-15 Years | 54 | 3.30 | 0.39 | | |
| | 16 years and above | 50 | 3.35 | 0.38 | | |
| | Total | 206 | 3.39 | 0.45 | | |

According to the t values, it was seen that there was a significant difference in terms of the status of receiving in-service training in special education teachers' computer use self-efficacy, computer use self-efficacy and technological integration competencies ($p<0.05$). According to the averages of the groups, the technology integration self-efficacy of special education teachers who received in-service training was found to be significantly higher.

Table 4. t Test Analyses Regarding the Comparison of Special Education Teachers' Technology Integration Competency Scores According to the Status of Receiving In-Service Training

| In-service Training | | N | Mean | Std. Deviation | t | P |
|---|---|---|---|---|---|---|
| Self-Efficacy to Use Computer Technologies | Without | 132 | 3.27 | 0.65 | -5.48 | 0.00 |
| | With | 74 | 3.79 | 0.66 | | |
| Self-Efficacy in Using Computer Technologies | Without | 132 | 3.20 | 0.51 | -4.18 | 0.00 |
| | With | 74 | 3.52 | 0.56 | | |
| Self-Efficacy Towards Technology Integration | Without | 132 | 3.24 | 0.38 | -6.79 | 0.00 |
| | With | 74 | 3.66 | 0.45 | | |

Table 5 shows the results of the comparison of the mean scores of special education teachers' technological integration competence scale and its sub-dimensions according to the variable of having postgraduate education.

Table 5. t Test Analyses on the Comparison of Special Education Teachers' Technology Integration Competency Scores According to Graduate Education Status

| | Post-Graduate | N | Mean | Std. Deviation | t | p |
|---|---|---|---|---|---|---|
| Self-Efficacy to Use Computer | Not | 176 | 3.42 | 0.71 | -2.00 | 0.05 |
| Technologies | Yes | 30 | 3.71 | 0.57 | | |
| Self-Efficacy in Using Computer | Not | 176 | 3.27 | 0.54 | -3.52 | 0.00 |
| Technologies | Yes | 30 | 3.66 | 0.48 | | |
| Self-Efficacy Towards | Not | 176 | 3.34 | 0.44 | -3.71 | 0.00 |
| Technology Integration | Yes | 30 | 3.69 | 0.43 | | |

t values of 2.00, 3.62 and 3.71 were calculated between the mean scores of teachers with and without postgraduate education on the Self-Efficacy in Using Computer Technologies subscale, 3.62 on the Self-Efficacy in Using Computer Technologies subscale and 3.71 on the total scores of the scale, respectively. According to the t values, a significant difference was found in terms of the variable of receiving postgraduate education in special education teachers' computer use self-efficacy, computer use self-efficacy and technological integration competencies ($p<0.05$). According to the averages of the groups, the technology integration self-efficacy of special education teachers who received postgraduate education was found to be significantly higher.

## Discussion

In this study, technology integration competencies of special education teachers were examined comparatively according to gender, professional seniority, in-service training and postgraduate education variables. According to the findings of the study, the computer use, computerization and general technology integration competencies of the participant special education teachers were found to be at a medium level. These findings are similar to the findings of the studies conducted by Doğru (2020), Kibici (2022), Ludlow (2001), Onivehu, Ohawuiro & Oyeniran (2017), Sarıkaya (2022), Sauers & McLeod (2018). Balmeo, Nimo, Pagel, Arisdaf-Quino, & Sanwen (2014) argue that special education teachers' instructional technology integration competencies should include the ability to access and effectively use technological tools appropriate for different student needs. For example, the ability to use specialized hardware or software for students with different intellectual or physical disabilities is important. Special education teachers' instructional technology integration competencies are important as they provide the ability to select the most appropriate technology for their students' specific needs. Teachers should select and implement the right tools taking into account the individual characteristics of the student, learning goals and how the student will use the technology. On the other hand, Latz, Stoner, and Stout (2008) emphasize the importance of special education teachers' ability to prepare technology-assisted instructional materials that are appropriate for their students. For example, teachers need to have technology integration competence in order to prepare specially designed interactive educational materials or learning applications for students with special needs. On the other hand, Young (2014) emphasizes teachers' instructional technology integration competencies and their ability to effectively incorporate technology into the teaching process. Teachers should use technology to engage students, promote interactive learning, and make learning more fun. In addition, special education teachers' instructional technology integration competencies include their ability to use technology effectively in monitoring and assessing students' progress. Teachers should be able to use technology-supported monitoring and assessment tools to track student performance and intervene when necessary. However, the fact that the technology integration skills of the special education teachers in the research sample are not high is a problem in terms of the realization of the above-mentioned instructional processes.

Another finding of the study is the comparison of technology integration competencies of special education teachers according to their gender and professional seniority. According to the research findings, technology integration competencies of male teachers were found to be higher than their female colleagues. In another finding of the study, an inverse but significant relationship was found between professional seniority and technology integration competence. As teachers' professional seniority increases, their technology integration competencies decrease. In particular, the demographic characteristics of teachers of children with special needs are the main determinants of their competence levels and attitudes towards the use of instructional technology. Therefore, it has become necessary to examine how some demographic factors such as gender and teaching experience mediate teachers' efficacy in the use of instructional technology. This is in line with Thomas and Stratton's (2006) perspective which emphasizes that many variables that influence teachers' efficacy and attitudes towards technology integration are influenced by gender, teaching experience, age and years in school. Therefore, some studies (Bebetsos & Antoniou, 2008; Kadel, 2005; Kibici, 2022; Onivehu, Ohawuiro & Oyeniran, 2017; Sarıkaya, 2022) found that gender affects teachers' efficacy and attitude towards technology use. Regarding teaching experience, research (Baek, Jong & Kim 2008; Buabeng-Andoh & Totimeh, 2012; Gorder, 2008; Onivehu, Ohawuiro & Oyeniran, 2017) found that teaching experience is significantly related to actual use of technology. With age, teachers' familiarity and experience with technology may change.

Especially in the case of what is referred to as digital immigration, it is possible that an individual who has recently adapted to technology may have more difficulties in using and integrating technology (Seger, 2011). On the other hand, the speed of adaptation to technology may generally be lower in older individuals (Kahn, 2011). While new technologies develop rapidly, it may take more time for older teachers to catch up and adapt to new technologies (König, Jäger-Biela & Glutsch, 2020).

The last finding of this study is about the trainings received by special education teachers and their technology integration competencies. According to the findings of the study, participants who received in-service trainings, especially on computer-assisted instruction, and those who received postgraduate education had higher technology integration self-efficacy compared to their colleagues who did not receive training. Sarıtepeci, Durak, and Seferoğlu (2016) determined that the most needed topics for teachers in their study were "the use of technology in education, the use of the internet for educational purposes, and the effective use of teaching materials". According to the researchers, in-service or postgraduate trainings significantly improve teachers' competencies on this subject. Ergin, Akseki, and Deniz (2012), on the other hand, found that teachers had problems in "implementing individualized teaching practices for children with special needs with different characteristics and using educational technologies". They stated that they needed advanced training and in-service training for all these issues. In these aspects, in-service trainings for special education teachers and ensuring their participation in graduate programs appear as an important factor in their professional competence and integration of technologies.

Based on the results of the study, applied in-service trainings, courses and informative distance or face-to-face trainings can be organized for special education teachers' technological integration. Since the technology integration self-efficacy of special education teachers was found to be moderate, activities can be planned to increase their self-efficacy levels. For the integration of teachers into new technologies, distance education programs should be organized to facilitate their lifelong learning and their postgraduate education opportunities should be facilitated. In order to keep the technology integration competencies of special education teachers at a high level, e-seminars and informative studies should be organized to introduce the latest technology to teachers and activities should be carried out to integrate technology into education. In future studies, the number of teachers can be increased and studies can be carried out by increasing the diversity of branches. Qualitative and mixed model studies can be conducted in order to investigate the technology integration self-efficacy levels of special education teachers more profoundly.

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