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The Predictive Role of Using 21st Century Learner Skills on Self-Efficacy in Teaching These Skills

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SUMMARY

21st century skills are emphasized as skills that all students should acquire today. Gaining these skills in educational environments is necessary to contribute to the welfare level of countries. Therefore, teachers are supposed to use 21st century skills in lessons, and their self-efficacy in teaching these skills is expected to be improved. In the current study, pre-service teachers' use of 21st century learner skills and the level of their self-efficacy in teaching these skills were investigated. Additionally, the extent to which pre-service teachers' use of 21st century learner skills predicts their self-efficacy in teaching these skills was questioned. A predictive correlational design was used and 168 students participated in the study. Data was collected through 21st Century Learner Skills Using Scale and Self-Efficacy in Teaching 21st Century Skills Scale, which was adapted to Turkish in the current study. Mean values were calculated to determine pre-service teachers' use of 21st century skills and their self-efficacy in teaching these skills. Additionally, simple regression analysis was used to analyze the predictive role of pre-service teachers' use of 21st century skills on their self-efficacy in teaching these skills. Results showed that pre-service teachers' use of 21st century skills and their self-efficacy in teaching these skills are above the mean, and pre-service teachers' use of 21st century learner skills significantly predicted their self-efficacy in teaching these skills. In light of this finding, recommendations were made for pre-service teachers to use these skills to support their self-efficacy in teaching 21st century skills.

Keywords: 21st Century Learner Skills Using Scale, Self-Efficacy in Teaching 21st Century Skills, pre-service teachers

INTRODUCTION

It is stated that teachers with low self-efficacy are less successful teachers than those with high self-efficacy (Onosko, 1991; Hampton, 1996) because the effective application of professional knowledge and abilities is dependent upon having a high level of self-efficacy, whereas a low level of self-efficacy inhibits this activity (Gavora, 2010). The reason for this situation is that people fear and avoid circumstances that they feel are beyond their capacity for coping, and they participate in behaviors they think they can cope with and act confidently (Bandura, 1978).

Given that teachers' self-efficacy beliefs are a strong predictor of how they will act (Gibbs, 2003), it can be stated that it is important to know the factors (resources) that contribute to the development of teachers' self-efficacy. In this context, identifying teachers' self-efficacy sources is important in terms of developing their self-efficacy and offering more effective teaching (Çapa-Aydın et al., 2013).

However, the sources of teachers' self-efficacy have not received enough attention in the literature, which has hindered the advancement of teacher self-efficacy research (Klassen et al., 2011). Klassen et al. (2011) examined studies on teacher efficacy between 1998 and 2009 and found that out of 68 studies, only seven studies (mostly qualitative or mixed method studies) offered empirical evidence on the subject. Morris et al. (2017) also found that methodological deficiencies in the literature prevent a thorough comprehension of how teachers improve a sense of efficacy.

The current study will contribute to the understanding of the sources of teaching self-efficacy by focusing on how pre-service teachers' use of 21st century skills predicts their self-efficacy in teaching these skills. In the literature, there are studies focusing on the 21st century skills of teachers or pre-service teachers (Karakoyun & Lindberg, 2020; Thieman, 2008; Urbani et al., 2017), examining their use of these skills (Göksün & Kurt, 2017; Orhan & Kurt, 2015), or examining self-efficacy in teaching these skills (Gentry et al., 2014; Wilborn, 2013). However, it has been determined that there is a paucity of research focusing on how pre-service teachers' use of 21st century skills predict their self-efficacy in teaching these skills. Nevertheless, it can be stated that determining the variables

that predict pre-service teachers' self-efficacy in teaching 21st century skills is important in terms of supporting this self-efficacy, using 21st century skills in classroom environments, and teaching them to students.

21st Century Learner Skills and Their Use

In the era we live in, different definitions have been made for young people such as digital natives, Generation Y, Google Generation or Net Generation (Bennett et al., 2008; Helpsper & Eynon, 2010 Prensky, 2001a). What these definitions have in common is that young people are growing up in a culture dominated by the internet and rich in media (Rowlands et al., 2008). Prensky (2001b) argued that the brains of young people who spend most of their time playing video games, engaging in instant messages, talking on mobile phones, and watching television become physically different as a result of the digital data they receive while growing up. In this argument, which he based on the latest research in the field of neurobiology, Prensky stated that different and various stimuli change the brain structure, affect the way people think and that these transformations continue throughout life.

Many findings are presented in the literature regarding the changing characteristics of young people defined as digital natives. For example, it is stated that these young people are accustomed to getting information fast, like multitasking, prefer graphics rather than texts and prefer random access (Prensky, 2001b). It is also seen that if they cannot access information sources with their fingertips, they become impatient, that they rarely think about the same subject for a long time, and that they prefer to access information mainly in non-print, digital sources (Pedro, 2006).

It is anticipated that the new generation of young people will transfer the changes in their abilities, expectations and communication and information literacy to education and research processes (Rowlands et al., 2008). For this reason, the changing and required learning skills of young people, who are 21st century learners, have become one of the focal points of today's educational research. It is seen in the literature that there are different classifications of the skills that 21st century learners should have. Some information about these classifications is presented in Figure 1.

P21 Learner Skills (Battelle for Kids, 2019).	World Economic Forum (WEF, 2015) 21st century skills	National Research Council (NRC, 2011)	OECD New Milenium Learners skills (Pedro, 2006)
•**-Learning and innovation skills** (critical thinking, communication, collaboration and creativity) •**-Media literacy and technology skills** (media literacy and information literacy) •**-Life and career skills** (self-direction, taking responsibility and initiative)	•**Foundatitonal literacies** (literacy, mathematical literacy, science literacy, ICT literacy, financial literacy, cultural and social literacy) •**Character qualities** (curiosity, initiative, persistence, adaptation, leadership, social and cultural awareness) •**Competences** (critical thinking/problem solving, creativity, communication and collaboration)	•**Cognitive skills** (non-routine problem solving, critical thinking, systemic thinking skills) •**Interpersonal skills** (complex communication, social skills, teamwork, cultural sensitivity and dealing with differences) • **Intrapersonal skills** (self-management, time management, self-development, self-regulation, adaptation and executive functioning)	•**Alternative cognitive skills** (e.g., acquiring information from digital sources, focusing on images and music rather than texts, and enjoying multitasking) •**Changes in cultural practices and social values** (e.g., people preferring to communicate with quick and immediate responses, communicating with new languages they have created in digital environments) •**Expectations for teaching and learning** (e.g. using information and communication technologies in schools, working collaboratively)

Figure 1. Classifications of 21st century learner skills

As seen in Figure 1, although the classifications of 21st century skills vary, these skills seem to be focused on daily and professional life skills, learning skills, information and communication skills, technology use skills and character qualities that must be possessed in order to adapt to today's world dominated by technological developments and to be successful in this world. More specifically, it is seen that the classifications focus on skills such as critical thinking, communication, collaboration, problem solving, media and information technologies literacy.

Different classifications and definitions of 21st century skills made by important initiatives such as P21, OECD, WEF and National Research Council (NRC) are an indication of the importance given to these skills. The reasons that make 21st century skills important can be addressed at economic, civil or global dimensions (Saavedra & Opfer, 2012). For example, the acceleration of global collaborations and competitions (Kay, 2010), technology's taking the place of workers doing routine work (Autor et al., 2003) or changing the ways of performing tasks (NRC, 2011) are some of the economic reasons. In addition to the 21st century skills required to keep up with the economic race, civil reasons also require the acquisition of some 21st century skills. For example, individuals need to have 21st century skills to analyze the news, vote consciously, make political suggestions, evaluate social conflicts, fulfil their responsibilities and exercise their rights so that a healthy society can be established (Saavedra & Opfer, 2012). In addition to economic and civil reasons, there are some global reasons for the acquisition of some skills. Major international migrations, internet use, long-haul flights, linked worldwide marketplaces, unstable climatic conditions, and international conflicts are examples of factors demonstrating how nations, states, and individuals are a part of a globally interconnected political, economic, and ecological network (Saavedra & Opfer, 2012). Therefore, having 21st century skills can be described as a necessity to be an individual, citizen and employee of the globalizing world.

Although there is a general agreement in the literature that 21st century skills should be imparted to students, not all students have equal access to them (Mugot & Sumbalan, 2019). One of the reasons for this situation can be attributed to the fact that the teachers of the future are not well trained on how to integrate 21st century skills into their classrooms. Although there are studies in the literature that have found that teachers and pre-service teachers' use of 21st century learner skills is moderate or above mean (Göksün, 2016; Gürültü el al., 2019), Mugot & Sumbalan (2019) and Tican & Deniz (2019) shed light on the shortcomings of pre-service teachers in applying 21st century skills. In the study conducted by Mugot & Sumbalan (2019), pre-service teachers stated that they feel inadequate in terms of technology use skills and classroom management in the process of applying 21st century skills in their classes. In the study conducted by Tican & Deniz (2019), pre-service teachers were found to be prepared to apply 21st century teaching techniques, but they could not benefit sufficiently from these skills in their practicum teaching in schools. In order to overcome these obstacles, teachers must have these skills (Gürültü, et al., 2008), be able to integrate these skills into their curriculum (Larson & Miller, 2011) and use them in their classes.

Self-efficacy in Teaching 21st Century Skills

"Call it a quiet revolution" (Walser, 2008, p.1). Walser (2008) used the word revolution to emphasize the process of integrating 21st century skills into educational settings. The answers given to questions about why 21st century skills should be included in the classroom environment can be explained as the world is changing and schools cannot keep up with this change (Kay, 2010). Deficiencies in students' participation and achievement in educational processes are among the reasons why schools cannot keep up with the requirements of the age (Marzono & Heflebower, 2011). For all these deficiencies to be eliminated, there is a need for a comprehensive education reform that addresses curriculum, teacher preparation, and school administration (Kozma, 2009).

With the reforms to be carried out in education, it is aimed to adapt to and influence worldwide trends in order to promote social and economic progress (Kozma, 2009). Although the business world and professions have changed rapidly in the last decade, schools are still doing nothing different than they have done in the last century (Beers, 2011). The knowledge and skills taught in classrooms often do not match the abilities and information that students will require in the future (Beers, 2011). Therefore, being successful in school does not offer generations a lifelong job and career, as it did in former years (Kay, 2010). The global world requires newly designed teaching, curricula and learning opportunities (Beers, 2011).

Teachers are one of the stakeholders who will implement curricula and design teaching environments tailored to 21st century skills (Gürültü et al., 2020). Given the focus on the Common Core Standards and the No Child Left Behind (2002) strategy, it is crucial that educators embrace 21st century skills as essential competencies that should be incorporated into all curricula rather than viewing them as extra curriculars (Larson and Miller, 2011). To effectively teach these abilities to their students, educators need to possess competencies and skills such as ongoing professional development, empathy, clear communication, problem-solving, setting a positive example, and

counseling (Tican & Deniz, 2019). In addition, teachers must constantly improve themselves in order to structure and manage instruction and learning activities, interact with students effectively, utilize technology wisely, evaluate their own teaching methods, and stay current with their education (Boaduo et al., 2011) because it's critical that educators support their students to apply knowledge, analyze, synthesize or discover new information, and to apply these skills collaboratively by integrating them with technology (Larson and Miller, 2011). In summary, teachers who educate 21st century learners should be able to use 21st century learner skills in their classrooms.

In order for teachers to impart 21st century skills to their students, their own competence in these skills is important (Özyurt, 2020). There are studies in the literature showing that pre-service teachers believe they are highly competent in acquiring 21st century abilities (Çolak, 2019; Özdemir-Özden et al., 2018). According to these studies, pre-service teachers consider themselves competent in life and career, lifelong learning and information, technology and media skills. However, it can be stated that considering oneself competent in a skill is not the same as considering oneself competent in teaching that skill. Bandura (1997) said the following on this subject: "having knowledge and skills does not produce high attainments if people lack the self-assurance to use them well" (p. 80). That is, if your self-efficacy to use a skill is not strong, having this skill will not result in high yields. Numerous studies show that teachers' beliefs about their teaching competences and abilities are important to achieve successful results in the teaching process (Lauerman & Hagen, 2021). In this context, teachers' self-efficacy beliefs about teaching 21st century skills will affect their ability to create appropriate learning environments to get their students to acquire these skills because self-efficacy beliefs have a determining role in human motivation, emotions and behaviours (Bandura, 1997). Teachers' self-efficacy in teaching 21st century skills is also important as it provides insights into their motivations, attitudes and behaviours towards teaching these skills.

The Relationship Between Using 21st Century Learner Skills and Self-Efficacy in Teaching These Skills

The answer to the following question will be conducive to understanding the relationship between using 21st century learner skills and self-efficacy in teaching these skills. "Is there a relationship between being able to use a skill and self-efficacy belief in teaching that skill?" In fact, Bandura (1997) touches upon this relationship in his book "Self-efficacy," where he explains the sources of self-efficacy. The relationship between the actions we take and self-efficacy is summarized in Figure 2, based on Bandura (1997).

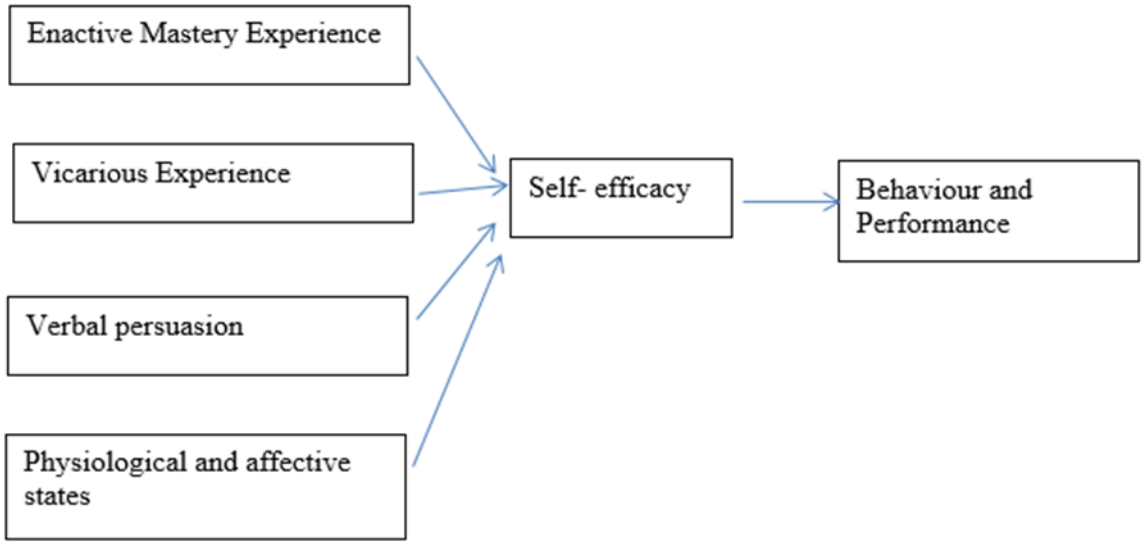

Figure 2. Sources of self-efficacy

As seen in Figure 2, one of the sources of self-efficacy is enactive mastery experience. According to Bandura (1997), Enactive Mastery Experiences (just the right experiences) have a stronger effect on self-efficacy acquisition than other elements. Successful performances in particular increase personal self-efficacy beliefs (Bandura, 1997). In other words, performing a task successfully supports increasing self-efficacy towards performing that task (Özdemir, 2008).

Based on Bandura's (1997) self-efficacy theory, it can be stated that any classroom practice of teachers will affect their self-efficacy towards that practice. After teachers have completed their classroom practices, they evaluate these practices, make a judgment about their adequacy regarding their performance, and carry out their further teaching in line with this reflection (Bandura, 1986). As higher mastery is gained on the acquired knowledge and skills, the development of personal competence is also supported (Bandura, 1997). In fact, Poulou (2007) found that the skills and abilities of pre-service teachers are a source of high teaching competence. Similarly, Choi and Lee (2018) revealed that teachers' attainments regarding a particular practice affected their self-efficacy. In addition, Göksün (2016) found that pre-service teachers' use of 21st century learner skills predicted their teaching

21st century teacher skills, and Tican and Deniz (2019) found a positive, mean and significant correlation between 21st century learner skills and 21st century teacher skills. The current study is based on the assumption that teachers' use of 21st century learner skills will predict their self-efficacy in teaching 21st century skills.

METHOD

The predictive correlational design was used in the study. The predictive correlational design is used to predict the score for another variable based on the score obtained for one variable, if there is a sufficiently large relationship between the two variables (Fraenkel, Wallen, & Hyun, 2012). If there is a single predictor variable, a single-factor predictive correlational design is used; if there is more than one predictor, a multi-factor predictive correlational design is used (Üztemur et al., 2020). In the current study, it was decided that the method would be a single-factor predictive correlational design, as it aimed to investigate how pre-service teachers' use of 21st century skills predicts their self-efficacy in teaching 21st century skills. The research questions to be answered in the study with this design are as follows:

1) What are the pre-service teachers' levels of using 21st century learner skills?

2) What is the pre-service teachers' self-efficacy in teaching 21st century skills?

3) Does the pre-service teachers' use of 21st century learner skills significantly predict their self-efficacy in teaching 21st century skills?

Participants

A total of 168 pre-service teachers studying in a state university located in the east of Turkey participated in the study. Of the participating pre-service teachers, 24 were attending the Department of Primary Teaching, 29 were attending the Department of Mathematics Teaching, 30 were attending the Department of Science Teaching, 52 were attending the Department of Pre-school Teaching and 33 were attending the Department of Turkish Language Teaching. Of the participants, 63 were male and 105 were female. In addition, 138 of the participants were fourth-year students and 30 were third-year students. The participants were in the age group of 20-36.

Data Collection Tools and Process

In the current study, there are two data collection tools. The "21st Century Learner Skills Using Scale" developed by Orhan and Kurt (2015) was used to determine the pre-service teachers' use of 21st century skills and the "Self-Efficacy in Teaching 21st Century Skills Scale" developed by Jia et al. (2016) and adapted for the study, was used to determine the pre-service teachers' self-efficacy in teaching 21st century skills. Data were collected in the fall term of 2019. Since the data was collected from students in different departments, it was difficult to reach these students. In order to reach the students, academicians from the relevant departments were interviewed and the scope of the study was explained. Academicians who agreed to support the study brought students and researchers together in a course they deemed appropriate. At the beginning of the data collection, all participants were informed about the study and that they were free to answer the scales. It was stated that the names of those who answered the scales would be kept confidential. Therefore, the voluntary principle was taken into account in collecting data. The volunteer pre-service teachers completed these scales in approximately 30 minutes.

21st Century Learner Skills Using Scale

Data on use of 21st century learner skills by pre-service teachers were collected using the "21st Century Learner Skills Using Scale" developed by Orhan and Kurt (2015). The scale is a 5-point Likert type and consists of four sub-dimensions: use of cognitive skills, use of innovation skills, use of collaboration and flexibility skills and use of autonomous skills, with a total of 31 items. The internal consistency coefficient of the scale was found to be .892, and the total explained variance was found to be 34.75% (Orhan and Kurt, 2015). A confirmatory factor analysis was performed, confirming the established construct ($\chi 2/df=0.65$; $p= 1.00$; RMSEA= 0.00) (Göksün and Kurt, 2017).

Self-Efficacy in Teaching 21st Century Skills Scale

The scale developed by Jia et al. (2016) to measure teachers' self-efficacy in teaching students about 21st century skills was adapted into Turkish in the current study. The original scale consisting of 10 items is a five-point Likert type and has three constructs: utility of technology, collaboration and innovation and problem solving.

In the adaptation process, the scale was first translated into Turkish. Then the construct validity of the scale was tested, and a reliability analysis was carried out. Three field experts including one associate professor, one research assistant, and one professor who had lived in America and was proficient at two languages, participated in the translation of the scale into Turkish. Adittionally, a Turkish Language teacher checked the scale in terms of grammar and comprehensibility. After the translation process was completed, an exploratory factor analysis was conducted to establish construct validity. In this regard, the normality, homoscedasticity and linearity assumptions were checked (Can, 2016). Descriptive statistics were then calculated and presented in Table 1.

Table 1. Descriptive Statistics of Scale Items

Item no	Mean	Standard deviation	Minimum scores	Maximum scores	Skewness	Kurtosis
1	3.00	1.03	1	5	.28	-.73
2	3.50	.91	1	5	-.11	-.16
3	3.68	.84	1	5	-.17	-.26
4	3.07	1.09	1	5	.29	-.75
5	3.51	.95	1	5	-.14	-.35
6	3.00	1.11	1	5	.21	-.64
7	3.28	.97	1	5	-.17	-.13
8	3.15	.94	1	5	.07	-.27
9	4.04	.91	1	5	-.57	-.42
10	3.34	1.03	1	5	.17	-.54

Table 1 shows that the skewness and kurtosis values of all the items are between -1.5 and +1.5, indicating that the distribution is normal (Tabachnick et al., 2013). Therefore, it can be concluded that the normality assumption was met. Another assumption is the homogeneity of variances, which means that the sample members have similar characteristics (Can, 2016). In the current study, the sample consists of pre-service teachers who have recieved training in argumentation in their respective disciplines. Therefore, it can be said that this assumption was also met. The final assumption requires a correlation coefficient of at least 0.30. The correlation matrix values show that the correlations between the items are at an acceptable level ($r > .30$) and that there is no cross-linearity($r > 0.8$). In addition, the determinant value was found to be .013, indicating that factor analysis is possible.

After all the assumptions were met, an exploratory factor analysis was carried out. KMO value which idicates whether the sample size is sufficient, and Bartlett's Test of Sphericity were computed, demonstrating that the data's variance and distribution properties are suitable for factor analysis. The KMO value should be greater than 0.5 and p-values should be less than .01 for Bartlett's Test of Sphericity (Feng and Chen, 2020). In the current study, the KMO value was calculated to be .87 and the p-value for Bartlett's Test of Sphericity was found to be .00.

After it was determined that the KMO and Bartlett values were suitable for factor analysis, the factor structure of the scale was attempted to be revealed. Findings regarding the factor loading of each item are presented in Table 2.

Table 2. Factor Loadings of Items

Item no	First factor	Second factor
10	.75	
9	.72	
1	.69	.33
3	.68	
4	.62	
7		.87
6		.80
8	.34	.66
5	.33	.65
2	.46	.53

Table 2 shows that the scale has a two-factor structure. The 9th, 10th, 1st, 3rd, and 4th items are grouped under the first factor. The 5, 6th, 7th and8th items are grouped under the second factor. However, the 2nd item loads in both of the factors and the difference between the loading values is lower than 0.01. Therefore, this item was removed (Büyüköztürk, 2019). Given that the 10th, 1st, and 4th items are gathered under the factor of "utility of technology" and the 9th and 3rd items are grouped under the factor of "collaboration" in the original scale, we decided to name the first factor "utility of technology and collaboration". In addition, since the 5th, 6th, 7th and 8th items are grouped under the factor of "innovation and problem solving" in the original scale, we used the same name for the second factor in the current study.

Table 2 shows that the factor loadings of the items in the first factor range from 0.62 to 0.75, and the factor loadings of the items in the second factor range from 0.65 to 0.87.

After the exploratory factor analysis, the factor structure of the scale was examined using a confirmatory factor analysis.

Confirmatory Factor Analysis: A confirmatory factor analysis provides fit indices. Before conducting the confirmatory factor analysis, in order to sequentially number the items within the same factor, we changed the item numbers as follows:

Table 3. Changed Numbers of the Items for Confirmatory Factor Analysis

The first number of the items	**The last/changed number of the items**
1	1
2	omitted
3	3
4	4
5	6
6	7
7	8
8	9
9	2
10	5

After changing the item numbers, the fit indices were calculated. The fit indices obtained from the confirmatory factor analysis for the current study are presented in Table 4.

Table 4. Calculated and Acceptable Fit Indices

Acceptable fit indices	**Calculated fit indices**
$2 < \chi 2 / df \leq 3$	2.77
$.05 < RMSEA \leq$ .08	.1
$.90 \leq NFI < .95$	.94
$.95 \leq NNFI < .97$	.95
$.95 \leq CFI < .97$	.96
$.90 \leq GFI < .95$	.91
$.85 \leq AGFI < .90$	.85

(Acceptable fit indices are from Schermelleh-Engel, Moosbrugger and Müller, 2003, p. 52).

As can be seen in Table 4, the fit indeces as x2 / df < 3 (it is 2.77 in the study), CFI < .97 (.96 in the study), AGFI< .90 (.85 in the study), GFI< .95 (.91 in the study), these values were considered as acceptable. The Table 4 also shows that the RMSEA value should be between .05 and .08. In our study it has a value of .1. Browne and Cudeck (1993, as cited in Lai et al., 2016) state that an RMSEA value between .08 and .1 as acceptable, whereas values greater than .1 are not acceptable. Therefore, the RMSEA value was also acceptable. The result of the confirmatory factor analysis is presented in Figure 3.

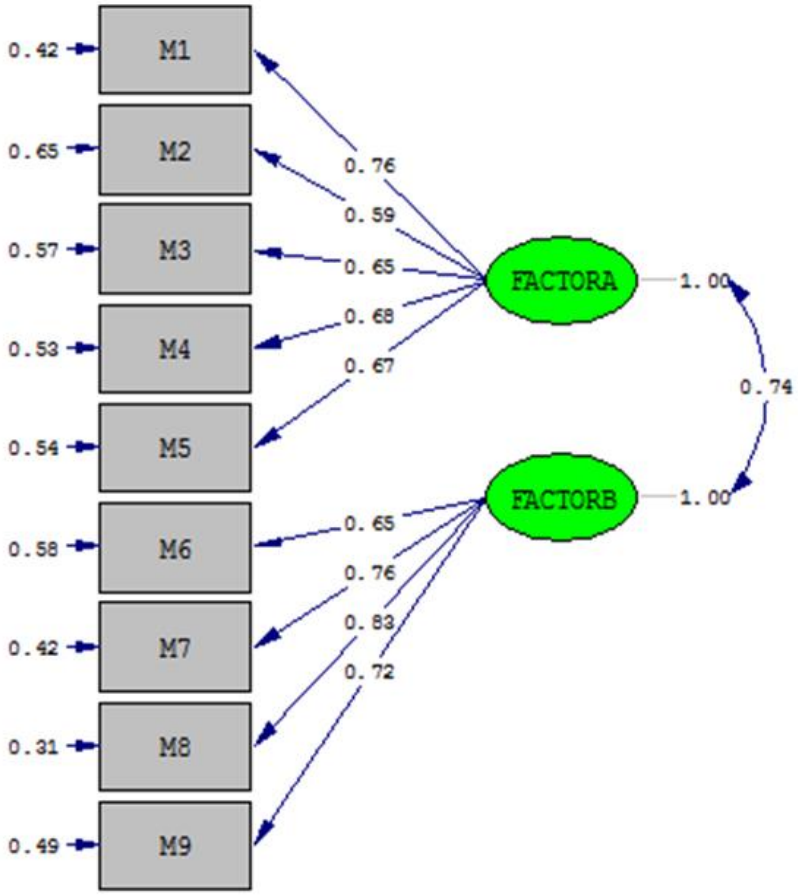

Figure 3. Confirmatory factor analysis results

As seen in Figure 3, the results confirm the two-factor structure of the scale. The first factor (Factor A) consists of 5 items and the second factor (Factor B) consists of 4 items. Following the confirmatory factor analysis, reliability analysis was carried out.

Reliability of the scale

To establish the reliability of the scale, the alpha value for each factor and the whole scale was calculated. The alpha value was found to be .86 for the whole scale, .80 for the first factor and .82 for the second factor. Therefore, the adapted scale was accepted as reliable.

Data Analysis

Different statistics were used to answer the research questions. Mean values were calculated for the first ("How are the pre-service teachers' levels of using 21st century learner skills?") and the second ("How is the pre-service teachers' self-efficacy in teaching 21st century skills?") research questions. Simple regression analysis was used to answer the third research question ("Does the pre-service teachers' using 21st century learner skills significantly predict their self-efficacy in teaching 21st century skills?").

FINDINGS

The findings are presented in line with the research questions.

Findings for the First and Second Research Questions

To find answers to the first and second research questions, descriptive statistics were used to determine the level of the pre-service teachers' use of 21st century learner skills and their self-efficacy in teaching these skills. The findings from these statistics are presented in Table 5.

Table 5. Descriptive Statistics from the Measurement Tools

Variables	n	X	Sx	Skewness	Kurtosis
Predictor variable (using 21st century learner skills)	168	3.72	0.49	0.01	-.12
Predicted variable (self-efficacy in teaching 21st century skills)	168	3.35	0.69	0.33	-.41

As seen in Table 5, the mean score obtained by the pre-service teachers from the 21st Century Learner Skills Using Scale is 3.72. Given that the scale is a five-point Likert type, it can be seen that this score is above the mean level.

Another finding presented in Table 5 is that the mean score of the pre-service teachers from the Self-Efficacy in Teaching 21st Century Skills Scale is 3.35. Given that the scale is a five-point Likert type, it was determined that this score is also above the mean.

Findings for the Third Research Question

The study also investigated whether the pre-service teachers' use of 21st century learner skills predicted their self-efficacy in teaching these skills. To this end, a simple linear regression analysis was performed. First, the assumptions of a simple linear regression analysis were checked. These assumptions and how they were checked are explained below.

- Normal distribution of the predictor and predicted variables: This assumption was checked with descriptive statistics. Descriptive statistics for both variables of the study are presented in Table 5.

When Table 5 is examined, it is seen that the skewness and kurtosis coefficients of the two scales are between +1.5 and -1.5 values, indicating that the normal distribution assumption is met (Kardaş & Şahin, 2020).

Another assumption of regression analysis is the existence of a linear correlation between the predictor and predicted variables. This assumption was checked with the Pearson Product Moment Correlation coefficient since the two variables were at a continuous and interval scale level. The findings of the analysis are presented in Table 6.

Table 6. Pearson Moment Product Correlation Coefficients Between the Variables

Variables	Using 21st century learner skills	Self-efficacy in teaching 21st century skills
Using 21st century learner skills	1.00	0.51**
Self-efficacy in teaching 21st century skills	0.51**	1.00

As seen in Table 6, there is a positive and significant correlation ($r = .51$; $p < 0.01$) between use of 21st century learner skills and the self-efficacy in teaching 21st century skills. Thus, it was revealed that the assumption of the linear correlation between the predictor and predicted variables for simple linear regression analysis was also met. Once all the assumptions were met, regression analysis was performed. The findings of this analysis are presented in Table 7.

Table 7. Findings of the Simple Linear Regression Analysis

Variables	B	SH_B	B	t	Sig	F	R	R^2	ΔR^2
Constant	0.70	0.35		2	0.04	58.66	0.51	0.26	0.25
Using 21st century learner skills	0.71	0.09	0.51	7.65	0.00				

Dependent variable: Self-efficacy in teaching 21st century skills

As seen in Table 7, use of 21st century learner skills was found to be a significant predictor of self-efficacy in teaching 21st century skills ($F(1, 166)= 58.66$, $p<0.05$). In addition, use of 21st century learner skills explains total variance at rate of 26% of the self-efficacy in teaching 21st century skills and ($R2 = 0.26$).

DISCUSSION and RECOMMENDATIONS

In the current study, we investigated whether pre-service teachers' use of 21st century learner skills is a significant predictor of their self-efficacy in teaching these skills. First, we evaluated the pre-service teachers' levels of use of 21st century learner skills and their self-efficacy in teaching 21st century skills. Then, we investigated whether using 21st century learner skills was a significant predictor of self-efficacy in teaching 21st century skills.

One of the findings obtained in the study is that pre-service teachers' level of using 21st century learner skills is above the mean. Similar findings have been reported in the literature. For example, in the study conducted by Göksün and Kurt (2017), it was determined that pre-service teachers' level of using 21st century learner skills is above the mean. Similarly, Kıyasoğlu and Çeviker-Ay (2020) also revealed that primary teachers' use of 21st century learner skills is above the mean. Another study that supports the findings of the current study and similar studies in the literature was conducted by Aydemir et al. (2020), and they found that pre-service social studies teachers' level of using 21st century learner skills was found to be above the mean. Therefore, the first finding of the study can be evaluated as pre-service teachers use of 21st century learner skills above the mean level.

When the age range of pre-service teachers is considered, it can be said that they belong to Generation Y. Santos (2017) defined this generation as motivated learners who learn by using digital technologies through constant exposure to various digital media environments. They also have an advanced mastery in the use of digital media and are successful in creating, developing and evaluating content. This may imply that pre-service teachers are ready to use 21st century learner skills. The study conducted by Tican and Deniz (2019), which determined that pre-service teachers were ready to use 21st century learner skills, confirms this inference.

In the current study, within the context of the generalizations made based on Figure 1, it is stated that 21st century skills include the skills that individuals must be possess in order to adapt to today's world dominated by technological developments and to achieve success in this world. Therefore, the fact that young people were born in a period of dynamic technological developments has begun to rapidly increased their exposure to the processes of using information and communication technologies, and these processes may have supported pre-service teachers in their use of 21st century learner skills.

Another reason why pre-service teachers use of 21st century learner skills above the mean level may be that these skills are addressed in their undergraduate programs. For example, in courses such as Introduction to Education and History of Turkish Education given in the Preschool and Science Teaching undergraduate programs of the Council of Higher Education (2018), trends in education in the 21st century are emphasized. Therefore, pre-service teachers' knowledge about the characteristics and scope of 21st century education and the skills that this education should impart to individuals may have supported them in using these skills. In this context, we recommended to making arrangements to provide opportunities for pre-service teachers to use these skills in undergraduate programs, as well as to support them in gaining knowledge about 21st century skills.

Another finding obtained in the current study is that the mean score obtained by the pre-service teachers from the Self-Efficacy in Teaching 21st Century Skills Scale is above the mean level. There are studies in the literature that support this finding. For example, Yıldırım et al. (2022) found that the mean scores teachers obtained by teachers from the self-efficacy perception scale regarding teaching 21st century skills are high. Similarly, the results of the study conducted by Quiño and Corpuz (2021) showed that teachers have high levels of self-efficacy in teaching 21st century skills. The results of the study conducted by Nuhoğlu and Seçkin (2021), Göksün and Kurt (2017), Kıyasoğlu and Çeviker-Ay (2020), Aydemir et al. (2020) also showed that the 21st century skills teaching scores of pre-service teachers and teachers were above the mean. One of the reasons why pre-service teachers' self-efficacy for teaching 21st century skills is above the mean score may be that pre-service teachers are using these skills above the mean level. Being able to use these skills supports self-efficacy in teaching these skills. Increasing teachers' self-efficacy in using a skill may also have improved their self-efficacy for teaching this skill because an increase in self-efficacy will also be reflected in the teacher's classroom practices. Davis (2018) concluded that the higher a teacher's self-efficacy is, the more effective they are in teaching 21st century skills. Wilborn (2013) found that positive attitudes towards teaching 21st century skills are reflected in educational practices, and Arslan et al. (2021) found that as the perception of 21st century teacher competences increases, the use of 21st century learner skills also increases. Therefore, it is recommended to provide practice-based training to pre-service teachers to improve their self-efficacy in teaching 21st century skills (Davis, 2018). The final finding of the current study is that the use of 21st century learner skills significantly explains the variance in self-efficacy in teaching 21st century skills (26%). There are studies in the literature showing that teachers with less professional experience have higher self-efficacy for teaching 21st century skills. For example, Yıldırm et al. (2022) revealed that the self-efficacy perceptions of teachers with 7-12 years of professional experience regarding teaching 21st century skills were significantly higher than the self-efficacy perceptions of teachers with 13-18 years of professional experience. Cemaloğlu et al. (2019) found that younger teachers' self-efficacy for teaching 21st century skills and their learning and renewal skills were at a higher level than other teachers. The reason for this situation, as stated by Yıldırım et al. (2022), may be that new graduate teachers received training on 21st century skills during their undergraduate

education, but older graduates did not. The right experiences have a strong effect on gaining self-efficacy (Bandura, 1997a). One of the reasons why accurate experiences are an important factor influencing self-efficacy is that they provide real evidence of one's ability to successfully perform any task (Palmer, 2006). Therefore, when a person completes a task correctly and makes reflective judgments about the situation, it will support their self-efficacy. Furthermore, it can be stated that it is important to increase the opportunities for pre-service teachers to use these skills in order to support their self-efficacy in teaching 21st century skills.

CONCLUSİON

There are three main findings from this study. The first finding is that the pre-service teachers' level of using 21st century learner skills is above the mean. The second finding is that the mean score taken by the pre-service teachers from the Self-Efficacy in Teaching 21st Century Skills Scale is above the mean level and the last finding is that using 21st century learner skills significantly explains the variance in the self-efficacy in teaching 21st century skills. These findings reveal that pre-service teachers are above mean in terms of using 21st century learner skills and teaching self-efficacy of these skills, but also reveal the need to move them to a more advanced level in terms of these variables. In addition, the last finding of the study emphasizes that the variance of the pre-service teachers' self-efficacy in teaching 21st century skills is explained by the use of 21st century learner skills with a rate of 26%. It can be stated that the fact that a single variable has an explanatory variance of 26% on another variable is a significant rate. Because this finding sheds light on educators and researchers that if we want to improve pre-service teachers' self-efficacy in teaching 21st century skills, it may be beneficial to provide learning environments that support their use of these skills. Therefore, researchers can focus on studies on designing learning environments that will support pre-service teachers' use of 21st century skills and how these designed learning environments affect pre-service teachers' self-efficacy in teaching 21st century skills.

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