DOI: 10.34056/aujef.1271748

The Examination of the Relationship Between Prospective Teachers' Creative Self-Efficacy and Teaching 21st Century Skills

Öğretmen Adaylarının Yaratıcı Özyeterlilik Düzeyleri ile 21. Yüzyıl Becerileri Öğretimi Düzeyleri Arasındaki İlişkinin İncelenmesi

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Article Type[3]: Research Article

Application Date: 27.03.2023 **Accepted Date:** 19.09.2023

To Cite This Article: Öpengin, E. & Elmas, İ. (2023). The examination of the relationship between prospective teachers' creative self-efficacy and teaching 21st century skills. *Anadolu University Journal of Education Faculty (AUJEF)*, 7(4), 804-818.

ABSTRACT: The purpose of this study is to examine the relationship between the teaching of 21st-century skills and the creative self-efficacy of prospective teachers. The research followed a correlational survey design and involved 175 prospective teachers enrolled at a university in the eastern region of Turkey. Data collection was carried out using the "21st Century Skills Teaching Scale" and the "Creative Self-Efficacy Scale." Descriptive statistics, t-tests, ANOVA, Pearson Correlation Analysis, and Linear Regression Analysis were employed to analyze the data. The findings revealed that the prospective teachers exhibited a high level of proficiency in teaching 21st-century skills and had a strong sense of creative self-efficacy. There was no significant difference in the level of teaching 21st-century skills and creative self-efficacy among prospective teachers from different departments. However, male prospective teachers demonstrated a higher level of proficiency in teaching 21st-century skills compared to their female counterparts. Furthermore, a positive and significant relationship was observed between the teaching of 21st-century skills and creative self-efficacy.

Keywords : 21st century skills, creative self-efficacy, prospective teachers

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ÖZ: Bu araştırmanın amacı, öğretmen adaylarının 21. yüzyıl becerilerini öğretme becerileri ile yaratıcı öz-yeterlikleri arasındaki ilişkiyi belirlemektir. İlişkisel tarama modelinde tasarlanan araştırma, doğuda yer alan bir üniversitede öğrenim gören 175 öğretmen adayı ile gerçekleştirilmiştir. Bu araştırmada veri toplama aracı olarak "21. Yüzyıl Becerileri Öğretimi Ölçeği" ve "Yaratıcı Öz Yeterlik Ölçeği" kullanılmıştır. Verilerin analizinde betimsel istatistikler, t-testi, ANOVA, Pearson Korelasyon Analizi ve Doğrusal Regresyon Analizi kullanılmıştır. Araştırma sonucunda öğretmen adaylarının 21. yüzyıl becerilerini öğretme düzeylerinin ve yaratıcı öz yeterliklerinin yüksek olduğu belirlenmiştir. Öğretmen adaylarının 21. yüzyıl becerilerini öğretme düzeylerinde ve yaratıcı özyeterliklerinde bölümlere göre anlamlı bir fark olmadığı, ancak erkek öğretmen adaylarının 21. yüzyıl becerilerini öğretme düzeylerinin daha yüksek olduğu belirlenmiştir. Ayrıca 21. yüzyıl becerilerinin öğretimi ile yaratıcı öz-yeterlik arasında pozitif ve anlamlı bir ilişki olduğu belirlenmiştir.

Anahtar sözcükler: 21.yy becerileri öğretimi, yaratıcı öz yeterlik, öğretmen adayları

1. INTRODUCTION

In the present era, there are unprecedented advancements and changes occurring in the economic, political, social, and technological realms. Particularly, technological progress, scientific innovations, globalization, and evolving workforce demands have resulted in a reevaluation of the skills necessary for individuals to contribute to society and be prepared for life (Wilmarth, 2010). However, the expectations placed on students and schools have also evolved. Nowadays, people are expected to effectively utilize technology to adapt to emerging changes, efficiently apply existing knowledge to meet their needs, and possess the creativity to utilize both their fundamental and advanced abilities (Levy & Murnane, 2005; Stewart, 2010). These skills and competencies, known as 21st-century skills, encompass the abilities individuals require in various aspects of life, including education, work, and social interactions, in accordance with the demands of the current century. In essence, 21st-century skills can be defined as the skills needed and cultivated in the present century (Griffin, McGaw, & Care, 2012).

There is a growing interest in conceptualizing, defining, and assessing 21st-century skills. Various international organizations and projects, such as the Assessment and Teaching of 21st-Century Skills project, the Partnership for 21st-Century Skills, the OECD's Definition and Selection of Competences, the International Society for Technology in Education, the Asia-Pacific Economic Cooperation, the European Commission, and the European Union's Key Competences for Lifelong Learning, have provided definitions for these skills (Ananiadou & Claro, 2009; Binkley et al., 2012; P21, 2019). Since the late twentieth century, a wide range of skills have been identified and grouped under the term "21st-century skills" (Lamb, Maire & Doecke, 2017). While there are variations among different frameworks, there is some consensus on the core skills (Lamb, Maire & Doecke, 2017). The Partnership for 21st-Century Learning Frameworks (P21, 2019) categorizes these skills into four groups: mastery of key subjects, learning and innovation skills (such as critical thinking, problem-solving, creativity, communication, and collaboration), information, media, and technology skills, and life and career skills (including self-direction, productivity, responsibility, flexibility, and adaptability). On the other hand, the National Research Council (NRC, 2012) does not have a separate category for information, media, and technology skills, but instead uses three categories: cognitive competencies (such as mastery of academic core content and critical thinking), interpersonal competencies (such as collaboration and communication), and intrapersonal competencies (such as self-direction). The ATC21S framework defines 21st-century skills in four broad categories: ways of thinking, ways of working, tools for working, and ways of living in the world (Binkley et al., 2012).

In addition to the aforementioned frameworks, there have been various assessments and evaluations of 21st-century skills. Lai and Viering (2012) defined these skills as metacognitive abilities, collaboration, critical thinking, motivation, and creativity. Kennedy and Odell (2014) identified critical thinking, global awareness, creativity, technology and media literacy, and productivity as components of these skills. Furthermore, there is a consensus that 21st-century skills encompass cognitive abilities such as critical thinking, problem-solving, and creativity; interpersonal skills such as teamwork, communication, cultural sensitivity, social skills, and resilience in the face of challenges; and intrapersonal skills such as personal development, self-management, adaptability, time management, lifelong learning, and self-regulation (Binkley et al., 2010; Soland, Hamilton, & Stecher, 2013; Yalçın, 2018).

In the contemporary global order, there is a strong emphasis on being an active and capable individual. To effectively navigate and contribute to society, possessing 21st-century skills has become increasingly necessary. Consequently, educational programs need to incorporate these skills. Economists

argue that educational institutions and systems are lagging behind, much like they did during the Industrial Revolution (Goldin & Katz, 2008). Merely teaching core subjects using traditional methods is insufficient in equipping students with the skills demanded by the modern world. As a result, one approach to bridging the gap between the requirements of the modern world and students' preparedness is to ensure that the curriculum is relevant and aligned with these demands.

Being enlightened eclectic teachers in the twenty-first century entails providing learners with opportunities and integrating 21st-century learning and innovation skills into the teaching context. It is crucial to move away from traditional methods that solely focus on mastering core subjects and instead combine them with contemporary skills such as communication, collaboration, creativity, critical thinking, as well as life and career skills and digital literacy (Taylor, 2009).

It is important to note that creative teachers play a vital role in creating a productive learning environment. Creativity involves being receptive to problems, identifying the factors that contribute to problem-solving, making and testing assumptions, and producing results (Torrance, 1979). It is the ability to exhibit original, flexible, and adaptable behavior when faced with challenges. Creativity often emerges when individuals generate original and appropriate ideas during the problem-solving process, particularly in situations where solutions are not readily available (Kaufman & Sternberg, 2007). It enables individuals to perceive events from different perspectives, generate novel and valuable thoughts, ask diverse questions, and find solutions to complex problems (Puccio, 2017). Creative skills also encompass innovative approaches to problem-solving and work styles (Taylor & Kaufman, 2020). In this era, teachers require these skills more than ever to effectively educate competent students.

The rapid evolution of technology is profoundly impacting human cognition, work, lifestyle, leisure, and creativity. Consequently, the significance of digital technologies in contemporary education has emerged alongside creativity as a crucial aspect (Mishra & Mehta, 2017). Gilroy (2015) argues that integrating 21st-century skills into educational programs should be a top priority to prepare students for unforeseen future challenges. Teachers play a vital role in equipping learners with these essential skills within the learning environment. Therefore, teachers must possess an open-minded and creative approach to adequately prepare future generations for the world of tomorrow. Otherwise, learners may struggle to successfully navigate the challenges of employment, social interactions, and academic life.

Teachers can be seen as facilitators and mediators who bring 21st-century skills into the learning environment, in addition to being a source of knowledge. However, there are certain factors that may hinder teachers' efforts to integrate these skills into the classroom. Not all teachers have the same backgrounds, prior knowledge, or resources to create optimal learning environments for 21st-century skills. Despite teachers recognizing the value of these skills, research indicates that they are not consistently incorporated into educational practices (Darling-Hammond et al., 2008; Fink, 2013; Voogt & Roblin, 2012).

Teachers can enhance their teaching strategies aligned with the development of 21st-century skills, such as problem-based learning, project-based learning, and inquiry-based learning, by cultivating self-efficacy, particularly creative self-efficacy. Self-efficacy refers to an individual's belief in their ability to perform in specific situations (Bandura, 1997). It influences individuals' goals, approaches, and level of effort in their endeavors. In the context of education, self-efficacy plays a crucial role in motivation, as it affects both student learning and teachers' professional behaviors (Klassen, Tze, Betts & Gordon, 2010). Creative self-efficacy, in particular, is essential for understanding how to enhance creative performance due to its motivational value. Teacher self-efficacy can be defined as teachers' personal

beliefs regarding their skills in planning, organizing, and implementing activities to achieve educational goals (Bandura, 1993). It encompasses teachers' perceptions of their individual and collective competencies that impact student learning. Teachers with high self-efficacy strive to enhance student achievement, set challenging goals for themselves, and work diligently to achieve those goals (Schwarzer & Hallum, 2008).

Similarly, creative self-efficacy refers to an individual's belief in their ability to generate and implement new and original ideas. It is considered a crucial personal attribute for creativity in the workplace (Tierney & Farmer, 2002). Creative self-efficacy is a motivational state that reflects an individual's belief in their ability to express creativity (Abbott, 2010). The significance of creative self-efficacy as a predictor of creative performance and achievement has been widely recognized (Karwowski, 2013; Tierney & Farmer, 2002). Teachers' creative self-efficacy has an impact on their creative teaching performance (Cayirdag, 2017; Liu & Wang, 2019; Ucus & Acar, 2018). The relationship between teachers' creative self-efficacy and their ability to teach 21st-century skills is complex, but it is generally understood that teachers with high levels of creative self-efficacy are more likely to effectively teach these skills to their students.

The study aimed to assess the correlation between the creative self-efficacy of prospective teachers and their perceptions of teaching 21st-century skills. It is crucial for teachers to possess creative self-efficacy as it enables them to develop innovative teaching strategies that align with the development of 21st-century skills, such as problem-based learning, project-based learning, and inquiry-based learning. These strategies go beyond traditional teaching methods and provide students with opportunities to enhance critical thinking, problem-solving, communication, and collaboration skills. Teachers with high levels of creative self-efficacy are more likely to be receptive to new ideas, willing to experiment with different teaching approaches, and comfortable with taking risks in the classroom. This mindset contributes to the creation of a dynamic and stimulating learning environment that fosters student engagement and motivation. Therefore, it is essential for prospective teachers, who will shape the future, to possess high levels of creative self-efficacy and confidence in their ability to teach 21st-century skills.

2. METHOD

2.1. Research Model

In this study, the researchers utilized the correlational research model. This model focuses on examining the relationships between two or more variables without altering them (Fraenkel, Wallen, & Hyun, 2012). The reason for choosing this model in the present study was to investigate the relationships between the confidence levels of prospective teachers in teaching 21st-century skills and their creative self-efficacy.

2.2. Participants

The study employed the convenience sampling technique, which involves selecting participants who are readily available (Büyüköztürk, Çakmak, Akgün, Karadeniz, & Demirel, 2016). The participants were chosen based on their easy accessibility and willingness to participate in the research. Research data were collected via an online survey. A total of 175 pre-service teachers, 117 female and 58 male studying at a University in the eastern region of Turkey took part in this study. Out of 175 pre-service teachers, 37 (21.1%) of them focused on social studies education, 35 (20 %) on elementary school

education, 28 (16%) on arts education, 27 (15.4%) on math education, 25 (14.3%) on Turkish education, and 23 (13.1%) on science education.

2.3. Instruments and Data Collection Process

In this study, "The 21st century Skills Teaching Scale" and “The Creative Self-Efficacy Scale” were used to determine pre-service teachers’ perceptions related to 21st century skills instruction, and creative self- efficacy respectively as data collection tools. Information on data collection tools is presented below.

The 21st Century Skills Teaching Scale was developed by Jia, Oh, Sibuma, LaBanca, and Lorentson (2016) to measure the self-efficacy perceptions of pre-service teachers regarding the teaching of 21st century skills. Participants rated their level of confidence in teaching activities defined by each item using a 7-point Likert scale ranging from 1 (not at all confident) to 7 (completely confident). The highest score in this scale is 70 and the lowest is 7. The Turkish adaptation was made by Özyurt (2020). After Exploratory Factor Analysis and Confirmatory Factor Analysis studies, the scale, which originally consisted of 16 items, took the form of 10 items and a three-factor structure. The sub-factors of the scale are named innovation and problem solving (4 items), collaboration (3 items), and utility of technology (3 items). This three-factoral structure explains 68% of the variance. The scale has no reverse items. The Cronbach's Alpha of the whole scale was calculated as .82. The Cronbach's Alpha values of the sub-factors were calculated as .83 for innovation and problem solving, .75 for collaboration and .81 for utility of technology. In current study, the Cronbach's Alpha of the whole scale was calculated as 0.89, utility of technology .75, collaboration .78, and innovation and problem-solving .83.

The Creativity Self-Efficacy Scale measuring employees’ beliefs in their ability to be creative in their work was developed by Tierney & Farmer (2002). The Turkish adaptation of the scale was made by Atabek (2020). The original scale is a 7-point and the Turkish adaptation is a 5-point Likert-type scale consisting of three items (1 = Very strongly disagree, 7/5 = Very strongly agree). The score range is 3–21/15, and higher scores indicate stronger creative self-efficacy. The scale includes items such as ‘I have confidence in my ability to solve problems creatively’ (Sorunlari yaratici bir bicimde cozme yetenegime guveniyorum). The Cronbach Alpha value of the Turkish adaptation of the scale was calculated as 0.84. In this study, it was calculated as 0.71 indicating that the scale was reliable (Field, 2018). The institutional review board approved the research procedures before the scale was administered to the sample. In this study, all rules specified to be followed within the scope of the "Higher Education Institutions Scientific Research and Publication Ethics Guidelines" have been followed. The necessary ethical committee approval was obtained by the Van Yuzuncu Yıl University Scientific Research Publication Ethics Committee with the decision dated 25.03.2021 and numbered 2021/05-25.

2.3. Data Analysis

The statistical analysis of the data were conducted using the SPSS 22 software for social sciences. According to the normality analysis, skewness values ranged from -.625 to 0.777 and kurtosis values ranged from -.542 to 1.884. The data showed a normal distribution within the range of -2 to +2 (Byrne, 2010; George & Mallery, 2010). Based on these results, parametric analysis techniques were used for

data analysis. Independent Sampling T-Test and ANOVA were used for examining differences, and Pearson Correlation Analysis and Linear Regression Analysis were used for correlation analysis.

3. FINDINGS

Descriptive values for all major scales and variables used in the research are provided in Table 1. An examination of the descriptive statistics indicated that the prospective teachers have high levels of teaching 21st century skills ($\bar{x}$=5.3840) and creative self-efficacy ($\bar{x}$=3.9829). It was found that the sub-dimensions of the 21st century skills teaching scale, namely the utility of technology ($\bar{x}$=5.3029), collaboration ($\bar{x}$=5.6724), and innovation and problem-solving ($\bar{x}$=5.2286) are also high.

Table 1: *Descriptive Statistics*

	$\bar{x}$	S	Min	Maks
21st Century Skills Teaching	5.3840	.91700	2.40	7.00
Utility of Technology	5.3029	1.10281	2.33	7.00
Collaboration	5.6724	1.02676	1.67	7.00
Innovation and Problem-Solving	5.2286	1.01209	2.25	7.00
Creativity Self-Efficacy	3.9829	.59292	2.00	5.00

The teaching of 21st century skills and creative self-efficacy perceptions of prospective teachers have been examined by a t-test to determine whether they differ by gender. Results show that participants creativity self-efficacy ($t(173) = 0.452$, $p > .05$), collaboration ($t(173) = -0.991$, $p > .05$) and Innovation and problem solving ($t(173) = -1.877$, $p > .05$) mean did not differ statistically in terms of gender. But there is a statistically significant difference in favor of men in the teaching of 21st century skills ($t(173) = -2.037$, $p < .05$) and the utility of technology ($t(173) = -2.426$, $p < .05$). In the utility of technology dimension, the men's average ($\bar{x}$=5.58, SS=1.09) was significantly higher than the women's average ($\bar{x}$=5.16, SS=1.08) and in the teaching of 21st-century skills the men's average ($\bar{x}$=5.58, SS=0.94) was also significantly higher than the women's average ($\bar{x}$=5.28, SS=0.89).

Table 2: *Pearson Product Moments Correlation Coefficients of the Dependent Variables*

	1	2	3	4
21st Century Skills Teaching (1)	-			
Creativity Self-Efficacy (2)	.334**	-		
Utility of Technology (3)	.845**	.264**	-	
Collaboration (4)	.857**	.239**	.566**	-
Innovation and Problem-Solving (5)	.923**	.359**	.665**	.718**

** All Pearson correlations (rs) $p < .01$.

Furthermore, we investigated the potential impact of participants' departments on their perceptions of teaching 21st-century skills and creative self-efficacy using an analysis of variance (ANOVA). The findings indicate that there were no significant differences in either the perception of teaching 21st-

century skills ($F(5,169) = 0.739$, $p > .05$) or creative self-efficacy ($F(5,169) = 1.320$, $p > .05$) across different educational departments.

Pearson Product Moment Correlation Coefficients were used in order to determine relationships between teaching 21st century skills and creative self-efficacy perceptions of participants (Table 2). When Table 2 is examined, it is seen that there is a moderate level, positive and significant relationship between the total scores of the creativity self-efficacy scale of prospective teachers and the total score of 21st century skills teaching scale ($r=0.334$; $p<.01$). Similarly, it is seen that there is a moderate level, positive and significant relationship between the creativity self-efficacy of participants and the sub-dimensions of the 21st century skills teaching scale as utility of Technology ($r=0.264$; $p<.01$); Collaboration ($r=0.239$; $p<.01$); Innovation and Problem-Solving ($r=0.359$; $p<.01$).

Follow-up regression analyses focused on participants' teaching 21st century skills as the dependent variable. When Table 3 is examined, as a result of the simple regression analysis, it is seen that there is a positive and significant relationship between creativity self-efficacy and teaching 21st century skills ($R=.334$; $R2=.112$; $p<.05$). This shows that creativity self-efficacy accounts for 11.2% of the total variance in 21st century skills teaching. The relationship between creativity self-efficacy and teaching 21st century skills is significant, $t= 7.452$, $P< 0.001$. As the participants' perception scores on creative self-efficacy increased, so did their perception scores on 21st century skills teaching. The regression model can be used to predict 21st century skills teaching from a participant's creative self-efficacy, $F (1, 173) = 21.754$, $p< 0.001$. According to the above analysis, the following regression equation evolving from the current model could be helpful for further implementations: Teaching 21st Century $\text{Skills}_{[\text{Participant A}]} = 3.325 + (0.517 \text{ x Creativity Self-Efficacy }_{[\text{Participant A}]})$.

Table 3: *Simple Regression Analysis on the Predictive Role of Creative Self-Efficacy in Teaching 21st Century Skills*

Model	Variable	R	R^2	F	sd	B	SH_B	b	t	P<
1	21st Century Skills Teaching	.334	.112	21.754	173	3.325	.446			0,000
	Creativity Self-Efficacy					.517	.111	.334	7.452	0,000

4. DISCUSSION and RESULT

In this study, which goal was to investigate the relationship between teaching 21st century skills and creativity self-efficacy among prospective teachers, it is observed that teacher candidates have a high level of teaching 21st century skills and creativity self-efficacy. These results are similar to other studies in the literature (Ainley & Luntley, 2007; Gürültü, Aslan & Alcı, 2020; Kozikoğlu & Altunova, 2018; Cemaloğlu, Arslangilay, Üstündağ & Bilasa, 2019). As a result of this study, it can be said that teacher candidates have the competence to teach 21st century skills and creativity self-efficacy at a level that fulfills the qualifications of the teaching profession. For the construction of both the individual and society, the development of the education system and its objectives, and the development of

professionally equipped teachers, it is of great importance that the teacher has creative competence and possesses 21st-century skills. Teachers who are expected to nurture creativity in their pupils should possess a strong sense of their own creative self-efficacy and take personal responsibility for developing their capacity to do so (Çayırdağ, 2017). As a matter of fact, teachers have a great influence on increasing the success of students (Stronge et al., 2015; Gürültü, Aslan & Alcı, 2020; Elmas, 2022). Considering the teachers' competencies in the results of this research, it can be said that teachers are promising in the construction of future generations.

There is no significant difference in prospective teachers' creative self-efficacy in terms of gender. Similar results are seen in different studies too (Polat & Kontaş, 2018; Cho, 2017; Mierdel & Bogner, 2019; Atabek, 2020). However, the results suggest that there are significant differences between male and female prospective teachers in their teaching of 21st-century skills and the utility of technology. In similar studies conducted with the 21st century skills, the level of the 21st century skills of men were found higher than that of women (Çevik & Şentürk, 2019; Engin & Korucuk, 2021). The finding that men score higher than women in these dimensions may reflect cultural or societal factors that influence the way individuals are socialized in terms of technology use and education. One possible explanation for the differences is that men are more likely to have grown up with greater access to technology and therefore have more experience using it. Another explanation could be related to cultural expectations and gender roles. Women may be less likely to pursue technology-related fields or may feel less confident in their ability to teach these skills. These factors could lead to differences in self-efficacy and ultimately affect performance in these areas.

However, it's important to note that while the results show statistically significant differences, the effect sizes are relatively small. This means that while there are differences between male and female prospective teachers in their teaching of 21st-century skills and the utility of technology, the differences are not necessarily large enough to have practical implications for teaching or learning outcomes. Indeed, there are also studies that find no significant difference according to gender (Cemaloğlu, Arslangilay, Üstündağ & Bilasa, 2019; Canpolat, 2021; Gökbulut, 2020). Moreover, there is no significant difference in prospective teachers' creative self-efficacy and teaching of 21st-century skills in terms of departments. There are different studies with similar results. As a matter of fact, studies have found that teachers' 21st century skills (Gürültü, Aslan, & Alcı, 2020; Kozikoğlu & Özcanlı, 2020) and creativity self-efficacy (Atabek, 2020) levels do not differ according to the department. Since this study was conducted with teachers from the same faculty of education, it can be inferred that all of these departments share a common educational approach.

The main finding of the study was that there is a significant positive relationship between teaching 21st century skills and creativity self-efficacy of prospective teachers. As their level of creativity self-efficacy increased, so did their teaching 21st century skills perceptions. Likewise, different studies related to 21st century skills found similar results. Kozikoğlu and Özcanlı, (2020) found a significant positive relationship between dedication to the profession and teaching 21st century skills. On the other hand, Canpolat (2021) found a significant relationship between emotional intelligence and 21st century skills.

According to the research, it is seen that there is a significant positive effect of teachers' creativity self-efficacy on teaching 21st century skills. This value indicates that 11.2% of the variance in teaching 21st century skills is explained by creativity self-efficacy. Creativity self-efficacy explains a significant portion of teaching 21st century skills. The sub-dimensions of teaching 21st century skills consist of technology, collaboration, innovation, and problem-solving. The level of these sub-dimensions has a

significant impact on creativity self-efficacy. Indeed, in other studies, it has been found that creativity self-efficacy significantly predicts creative performance (Byrge & Tang, 2015; Chang, Wang, & Lee, 2016; Çayırdağ. 2017; Gu, He, & Liu, 2017; Huang, Chang, & Chou, 2020; Tierney & Farmer, 2011). As a result of all these studies, it can be said that creativity self-efficacy is important for teaching 21st century skills.

However, the successful implementation of creativity in education largely depends on teachers (Bereczki & Karpati, 2018). Teachers with high self-efficacy can compete by showing change and progress in their own insights, providing timely process and feedback on their teaching knowledge, anticipate unexpected events, and often take initiative to control their teaching activities (Anderson et al., 2021). In addition, teachers with high self-efficacy levels also use various teaching strategies to increase student success (Boujut et al., 2017). This shows that creative teaching will provide teaching ideas using new and meaningful creativity and teaching strategies. Our suggestion is that prospective teachers, who are anticipated to nurture creativity in their students, should possess a robust belief in their own creative abilities and take personal accountability for enhancing their capacity to foster student creativity and teach in a creative manner.

Certainly, teachers play a critical role in teaching 21st century skills. They are responsible for designing and implementing learning experiences that develop students' abilities to think critically, communicate effectively, collaborate with others, and use technology to solve problems. Thus, creative teaching is a necessary skill for teachers, and this teaching method can improve how sensitive and talented students are at learning (Chen & Yuan, 2021). Teachers with high creative self-efficacy are more likely to try new approaches, and design innovative learning experiences that engage students and foster their creativity. They are better able to create a classroom culture that values creativity and encourages students to think outside the box. Furthermore, they can use a variety of instructional strategies, such as project-based learning, design thinking, and inquiry-based learning, to engage students in hands-on, real-world problem-solving activities that require creativity and innovation.

In conclusion, teachers' creative self-efficacy and 21st century teaching skills are crucial for providing high-quality education to students in today's world. Teachers who are confident in their own creativity and have the ability to integrate technology and other modern teaching strategies into their classrooms can inspire and engage students in meaningful ways. By focusing on developing these skills, teachers can create an environment that fosters innovation, critical thinking, and problem-solving among students. With the rapid pace of technological advancement and changes in society, teachers need to adapt their teaching methods to keep up with the times. This requires a willingness to embrace creativity and innovation in the classroom, as well as a commitment to ongoing professional development. By developing their creative self-efficacy and 21st century teaching skills, teachers can provide students with the tools they need to succeed in an ever-changing world. Ultimately, investing in the development of teachers' skills is an investment in the future of education and the future success of our students.

As a result, teachers' creative self-emotional and 21st century teaching skills are crucial to providing high-quality education to students in today's world. Teachers who are confident in their own creativity and have the ability to integrate technology and other modern teaching strategies into their classrooms can inspire and engage students in meaningful ways. By focusing on developing these skills, teachers can create an environment that fosters innovation, critical thinking, and problem solving among students. With the rapid pace of technological progress and changes in society, teachers need to adapt their teaching methods to keep up with the times. This requires a commitment to continuing professional

development as well as a willingness to embrace creativity and innovation in the classroom. By developing creative self-emotional and 21st century teaching skills, teachers can provide their students with the tools they need to succeed in an ever-changing world. Ultimately, investing in the development of teachers' skills is an investment in the future of education and the future success of our students.

In conclusion, the study suggests that there is a notable association between the creative self-efficacy of prospective teachers and their ability to teach 21st century skills. Nurturing a solid sense of creative self-efficacy can boost the confidence of future educators in promoting learning and innovation in their classes, which can eventually lead to a more enthusiastic and capable workforce. Therefore, teacher training programs must include training on creative thinking and 21st century skills so that they can equip upcoming teachers with the essential tools to help their pupils succeed in the contemporary world.

In spite of important results, this study has limitations. Firstly, the study only focused on prospective teachers and did not take into account the experiences of practicing teachers, which could have provided a more comprehensive understanding of the relationship between creative self-efficacy and teaching 21st century skills. Second, the self-reported nature of the data may have resulted in biased or inaccurate responses from participants. They may have over reported their creative self-efficacy or their ability to teach 21st century skills. Lastly, the study did not consider other factors that may influence the relationship between creative self-efficacy and teaching 21st century skills, such as teacher training, classroom management, and teaching strategies. Therefore, future studies should take into account the creativity demonstrated by teachers and its impact on the actual performance of students' learning experiences related to 21st century skills.

Author Contributions

Authors were involved in concept, design, collection of data, interpretation, writing, and critically revising the article. All authors approve the final version of the article.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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