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Teacher and Student in the 21st Century: A Mixed Design Research

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ABSTRACT

This study aims to investigate the effect of the teaching practice course on gaining 21st century teacher skills for pedagogical formation group teacher candidates. Participants views on the course, 21st century teachers, 21st century students, and metaphors created regarding these are also examined. We employed an embedded mixed design. In the quantitative part of the study, a single-group pre-test and post-test experimental design is used. The qualitative part is conducted with phenomenology. For data collection purposes, the 21st century teacher skills use scale, a semi-structured interview form, and a metaphor form were used. We found that the teaching practice course is effective for gaining 21st century teacher skills. This result can be interpreted as teacher candidates enrolled in pedagogical training programs being able to complete the program with acquired teaching skills and being capable of providing the necessary education to their students, composed of 21st century learners. Participants expressed their views on the concepts of 21st century teacher and 21st century student under different categories. Teaching practice courses contributed under the categories of professional skills, professional knowledge, and attitudes and values. Metaphors created by the participants on the concept of the 21st century teacher were related to guiding, updating knowledge, being productive, and being innovative, and on the concept of the 21st century student, they were related to developing, being able to load lots of information into the mind, fulfilling what is expected of them, and being in constant struggle. These results provide a significant insight into how teacher candidates perceive 21st century educational concepts and teacher-student roles.

Keywords:
Teaching practice, 21st century teacher skills, teacher candidates, metaphor, interview

1. Introduction

In the changing and developing world conditions, raising individuals who can meet the needs of the age and the future in educational environments is a necessity. It is the duty of the education system to train well-equipped individuals. This situation imposes important roles and responsibilities on teachers. Teachers play a leading role in educating individuals with the desired qualifications. Students direct their lives as reflections of their teachers. It is expected that teachers should have the skills to train students according to the requirements of their age.

In the 21st century, education needs to adapt to new ways of living and learning. Instead of traditional teaching, where teachers are the focus, education should now revolve around students. Teachers should take on the role of guiding and supporting students as they take charge of their own learning. Teachers are expected to support students' desire to produce a product and their sense of curiosity and to be active in guiding students with different solution suggestions when they need them (Kıyasoğlu, 2019). Teachers should be able to offer up-to-date content to their students according to the needs of the age group (Bashir et al., 2014; Lunenberg et al., 2007). Additionally, teachers of the new century should closely follow technological

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developments, carry these developments to their classrooms, use them actively, and have the equipment to guide students in using digital technologies (Palfrey & Gasser, 2008).

For a teacher to successfully lead their students' learning journey, they must start by understanding their students thoroughly and then create teaching plans that suit each student's individual traits. (Melvin, 2011). This has revealed the necessity for teachers who know 21st century students, can communicate well with them, and can guide them (Göksün & Kurt, 2017). Considering the students' individual differences in the teaching process, the teacher's use of different teaching methods and techniques will increase the motivation and success of the students towards the lesson. In this case, the desired goals will be achieved to a large extent (Sanders & Rivers, 1996).

It is stated that teachers who strive to have the skills required by the 21st century, to be useful to their students, and to make themselves qualified are more committed to their profession. They actively seek to generate solutions by showing increased sensitivity to societal issues. Additionally, they endeavor to maintain their connection with the field of education (Shukla, 2014). In addition, there are many studies that prove that teacher quality is important for student performance (Sirait, 2016) and that teachers' competencies directly affect their students' success and competencies (Burroughs et al., 2019; Tschannen-Moran & Barr, 2004; Wayne & Youngs, 2003). Therefore, it is expected for teachers to have 21st century teaching skills in order for their students to gain 21st century skills.

1.1. 21st Century Teaching Skills

The skills that teachers should have in the 21st century differ from those of the past. There are classifications made by different people and institutions to define 21st century skills. The Turkish Ministry of National Education MoNE) has specified the teacher characteristics under the study "Teacher Competences: General and Special Field Competences of the Teaching Profession" in six main competence areas: "getting to know the student", "personal and professional values", "learning, evaluation, and monitoring", "professional development", "learning and teaching process", "society, school, and family relations," and "content and program information" (MEB, 2008). The general competence areas for the teaching profession were specified as professional knowledge, professional skills, attitudes, and values (MEB, 2017).

Lemov (2010) developed a structure consisting of different techniques in order to improve teaching skills in the teaching profession. This structure consists of seven titles. These titles are specified as setting high academic expectations, making plans to ensure academic success, ensuring student participation, creating and presenting lessons, maintaining and setting high behavioral expectations, establishing a better classroom culture, and building an honest character.

A comprehensive study of teacher competencies was conducted by the International Society for Educational Technologies. Competence areas are explained as: facilitating learning and encouraging creativity; being an example for working and learning in the digital age; designing and developing learning environments and assessment activities suitable for the digital age; participating in leadership activities and professional development; and being a model in digital citizenship (ISTE, 2015). When the studies dealing with the 21st century skills of teachers are evaluated in general, it is possible to say that a holistic perspective and similar features stand out in the studies. Teacher training institutions should put these features at the center and train prospective teachers equipped with 21st century skills.

1.2. Teaching Practice

Within the scope of teacher training, besides the theoretical courses given in education faculties, teaching practice courses are also included. In both undergraduate and pedagogical certificate education programs, the teaching practice course extends for two semesters, with a total of 6 (six) class hours per week. The program includes practical studies that help students prepare effectively for teaching. It equips them with the ability to apply the knowledge, skills, attitudes, and behaviors they've acquired during their studies, both in general education and their specialized field, within real classroom settings. Teacher candidates are observed by the practice teacher and the practice instructor during the practice. Constructive feedback is given to teacher candidates by discussing their strengths and aspects that need to be developed. The performance and development level of the teacher candidate during the application process are evaluated together by the practice teacher and the instructor (YÖK, 2021). Practical activities in teacher training programs contribute to

the development of teacher candidates' teaching skills by providing the opportunity to transform theoretical knowledge into practice (Bayat & Öztürk, 2017). The first part, the teaching practice course, gives teacher candidates the chance to put their knowledge and abilities into practice, and the last stage provides teaching counseling (Struyk & McCoy, 1993).

1.3. Importance of the Study

In the literature, 21st century learning and teaching skill are investigated under the names of classroom teachers' level of using 21st century teaching and learning skills (Kıyasoğlu & Çeviker Ay, 2020), 21st century teaching skills (İncik Yalçın, 2020), the relationship between classroom teachers' critical thinking skills and 21st century teaching skills (Karabekmez, 2021), the relationship between teachers' 21st century teaching skills and their dedication to the profession (Kozikoğlu & Özcanlı, 2020), the characteristics and development of 21st century teachers (Jan, 2017), teacher quality and learning outcomes (Araujo et al., 2016), use of technology to support teaching and learning in the 21st century and teacher beliefs (Ertmer et al., 2016), preparing 21st century teachers (Astuti et al., 2019), 21st century skills learning and teaching integration (Rusdin, 2018; Utami et al., 2018). Studies mostly focus on due diligence or investigating the relationship between different variables. No studies were found in the literature in which 21st century teacher skills were examined through experimental studies. In this study, the effect of the teaching practice course on gaining 21st century teacher skills for pedagogical formation group teacher candidates, their views on the course, and the metaphors they formed for the concepts of 21st century student and 21st century teacher were examined.

This study gives clues about whether the teaching practice course included in the pedagogical formation program gives teacher candidates the skills to teach in the 21st century. The fact that this study was conducted using the mixed method adds unique value to the study. Examining the effectiveness of the teaching practice processes of teacher candidates enrolled in the pedagogical formation program who have not graduated from the faculty of education also makes the study meaningful.

1.4. The Aim of the Study

The aim of the study is to investigate the impact of the teaching practice course on providing pedagogical formation group teacher candidates with 21st century teaching skills, as well as examine the candidates' perspectives on the course. The study also seeks to explore the metaphors and opinions created by the teacher candidates regarding the concepts of "21st century student" and "21st century teacher." In this context, the following questions have been addressed:

- Is there a significant difference between the pre-test and post-test scores of the 21st century teacher skills use scale of participants?
- What are the views of participants about the teaching practice course?
- What are the views of the participants on the concept of the 21st century teacher?
- What are the views of the participants on the concept of the 21st century student?
- What are the metaphors that the participants created for the concept of the 21st century teacher?
- What are the metaphors that the participants created for the concept of the 21st century student?

2. Method

2.1. Design

The embedded mixed design, one of the mixed research designs, was utilized in this study. In the embedded mixed design, quantitative and qualitative data are collected sequentially or simultaneously, and one group of data is used to support the other data group. The second set of data is collected to supplement the primary data set and reveal different perspectives. In the embedded mixed design, the researcher should provide qualitative support into the quantitative design or quantitative support into a qualitative design. The supporting abutment used in the embedded pattern should strengthen the whole design from different aspects (Creswell & Plano-Clark, 2007). A single-group pre-test, post-test experimental design is used in the quantitative part of this study. This design is ideal for situations where it is difficult to find a control group and there is a need to examine the change in a particular group over a period of time (Creswelll, 2012). Phenomenology is used in the qualitative part of the study. In phenomenology studies, the participants'

feelings, perceptions, and thoughts and how they structured them in their minds are investigated (van Manen, 2016).

2.2. Participants

The convenience sampling method is used to determine the study group. The method of convenient sampling is employed when individuals who are readily available, easily accessible, and willing to participate in the research are included in the sample (Johnson & Christensen, 2019). 12 students enrolled in the formation program at the education faculty of a state university and taking the teaching practice course in the 2021–2022 academic year constitute the study group. The study was carried out over a 12-week period.

2.3. Data Collection Tools and Analysis of Data

21st Century Teacher Skills Use Scale: Created by Orhan Göksun (2016), the 21st century teacher skills use scale is a 5-point Likert-type scale with 27 items. The scale is a frequency scale ranging from "always (5)" to "never (1)". The scale has five sub-dimensions: managerial skills, affirmative skills, technopedagogical skills, productive skills, and flexible teaching skills. The skills on the scale are defined as administrative skills: classroom management, managing the teaching process and activities; affirmative skills: using approaches of affirmation of correct behaviors; techno-pedagogical skills: the ability to integrate technology and teaching in teaching processes; productive skills: the ability to produce instructional materials; and flexible teaching skills: making teaching independent of the classroom environment. High scores obtained from the scale or sub-dimensions indicate that there is frequent use of 21st century teacher skills.

For the analysis of the quantitative data, an examination was conducted to determine if the data on the teacher candidates' 21st century teacher skills use scale was normally distributed. Table 1 gives information on the data's normality test.

Table 1. *Normality test*

Test	N	Shapiro-Wilks	Arithmetic Mean	Sd	Ss	Skewness	Kurtosis
Pre-Test	12	.078	1.84	11	.205	-.289	-1.536
Post-test	12	.561	3.77	11	.110	-.148	-.837

Table 1 shows that the pre-test and post-test scores of participants regarding the use of 21st century teaching skills are normally distributed (SW =.078; Sd =11; $p>0.05$; SW =.561; Sd =11; $p>0.05$). Therefore, pre-test and post-test mean scores were analyzed with a dependent sample t-test.

Semi- Structured Interview Form: To assess the participants' views on the concepts of 21st century teacher and 21st century student, a semi-structured interview form was created. The obtained data was analyzed using content analysis. Content analysis is commonly used to organize and analyze data collected through qualitative data collection tools (Fraenkel et al., 2012). The main purpose of content analysis is to reach themes, categories, and codes that can explain the relationships between concepts (Marshall et al., 2021).

To ensure the consistency of the results obtained from qualitative data analysis, it is stated that the coding can be reviewed by the same coder 10–14 days later (Flick, 2014). The obtained data was re-analyzed with an interval of 10 days. The reliability coefficient between the two encodings was calculated using Miles & Huberman's (1994) formula (consensus/consensus+disagreement). The consistency between codes was calculated at 93%. In accordance with the principles of research ethics, direct quotes from the participants were coded as "S+Number" to protect their identity.

Metaphor Form: We developed a metaphor form to examine the metaphors created by the participants for the terms "21st century teacher" and "21st century student". Metaphors, which are a way of thinking (Forceville, 2002), are used to explain the properties of events or objects (Patton, 2014). Metaphors can be used to understand how individuals perceive concrete or abstract concepts and how they interpret them (Fábián, 2013; Zheng & Song, 2010). We presented the participants' metaphors in tables with their justifications.

2.4. Experimental Implementation Process

The applications were conducted in line with the teaching practice course, 2 hours a week, over a 12-week period in the 2021–2022 academic year. Within the scope of this course, teacher candidates went to selected schools for in-class teaching practice for six hours a week. They also attended the two-hour lectures conducted

by the relevant instructor at the education faculty in order to evaluate their teaching practices and to correct their inadequacies. The instructor's responsibilities include educating the students, offering feedback, and outlining the details of the teaching practice course throughout the study. The design of the study is given in Figure 1.

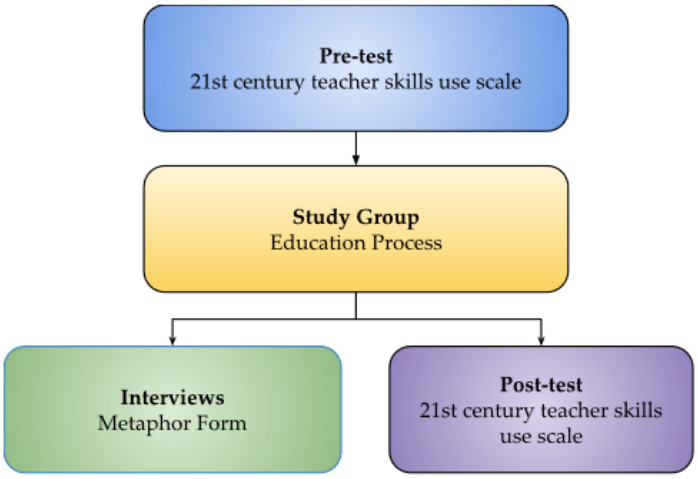

Figure 1. *Study design*

2.5. Ethical

In this study, all the rules specified to be followed within the scope of "Higher Education Institutions Scientific Research and Publication Ethics Directive" were complied with.

Name of the Ethical Evaluation Committee: Dicle University

Date of Ethics Evaluation Decision: 31.03.2022

Ethics Evaluation Document Issue Number: 89

3. Results

Table 2 presents the results of the dependent samples t-test analysis applied to the participants' pretest and posttest scores.

Table 2. *Dependent samples t-test results*

Tests	N	$\bar{x}$	ss	sh	sd	t	p
Pre-Test	12	1.84	.20	.059	.11	-24.79	.000*
Post- Test	12	3.77	.11	.031			

*p≤0.05

According to Table 2, teacher candidates' 21st century teaching skills use scale post-test mean score ($\bar{x}$ = 3.77) is higher than the pre-test mean score ($\bar{x}$ = 1.84). In addition, the difference between the means was found to be significant (t = 24.79, p≤0.05). Based on these findings, it can be said that the teaching practice course had a positive effect on the frequency of use of 21st century teacher skills by the study group.

The views of the participants were examined and the findings are presented in Table 3.

Table 3. *The views of the participants on the contributions of the teaching practice course*

Theme	Category	Code	f
Views on the contributions of the teaching practice course	Professional knowledge	Method and technical knowledge	9
		Examination of the curriculum	8
		Legislation information on teacher profession	6
		Rights and responsibilities of education stakeholders	6
	Professional skill	Ability to prepare a lesson plan	11
		Ability to use suitable methods and techniques	10
		Ability to prepare assessment and evaluation tools suitable for the purpose	10
		Ability to make process and result oriented assessments and evaluations	9
		Ability to use communication and information technologies	9

		Ability to prepare teaching material	8
		Enabling students to actively participate in lessons	8
	Attitude and values	Paying attention to effective communication	9
		Being tolerant of individual and cultural differences	8
		Willingness to share with colleagues	7
		Acting in accordance with professional ethical principles	6
		Adopting the understanding that every student can learn	5
		Adopting the importance of raising students in accordance with national and universal values	5

Table 3 shows that the views of the teacher candidates regarding the contributions of the teaching practice course are grouped into three different categories. The most common code under the category of professional knowledge was "method and technical knowledge", the most common code under the category of professional skills was "ability to prepare lesson plans,", and the most common code under the category of attitudes and values was "paying attention to effective communication". Examples of teacher candidates' views on the code with the highest frequency in each category are as follows:

S1: After the teaching practice course, I think that I have knowledge about the selection and appropriate use of different teaching methods and techniques suitable for the subject covered.

S7: I had the opportunity to both prepare a lesson plan and examine and evaluate the lesson plans prepared by my friends in the teaching practice course. Now I can easily prepare lesson plans that will promote target behaviors.

S11: We learned that a teacher's good communication with his or her students positively affects the students and the classroom environment. We also experienced the importance of a teacher having characteristics such as empathy, fairness, and competence in order to communicate effectively with his students during the implementation.

The views of the participants were examined and the findings are presented in Table 4.

Table 4. *Views of the participants on the concept of the 21st century teacher*

Theme	Category	Code	f
21st century teacher	Student development	Preparing students for life	10
		Educating students for the digital age	9
		Guiding the student	8
		Supporting student autonomy	7
		Recognizing the student	6
		Motivating the students	6
	Content and pedagogical knowledge	Knowing the concepts, principles and generalizations in the content	9
		Have up-to-date content knowledge	8
		Ability to associate the content knowledge with other contents	6
	Cooperation	Collaborating with colleagues	6
		Collaborating with the school administration	4
		Collaborating with the parent	4
	Social-environmental dimension	Taking an active role in the preparation of social, cultural and sports activities	5
		Coordinate between school and other institutions	4
	Learning-teaching process	Ability to use digital technologies	11
		Ability to carry out the teaching process student-centered	10
		Ability to prepare educational materials	9
		Ability to use different teaching methods	9
		Being able to plan the teaching process according to the requirements of the age	8
		Ability to continue teaching according to individual differences	7
	Personal characteristics	Ability to communicate effectively	8
		Innovator	7
		Productive	7
		Tolerant	6
		Conscious of their responsibilities	6
		lifelong learner	5
		Respectful of different cultures	4

Table 4 shows that the views of participants on the concept of the 21st century teacher are grouped into six different categories. Under the category of student development, the most common code was “preparing students for life”, under the category of content and pedagogical knowledge the most common code was “knowing the concepts, principles and generalizations in the content”, under the category of cooperation the most common code was “collaborating with colleagues”, under the social-environmental dimension category the most common code was “taking an active role in the preparation of social, cultural and sports activities”, under the learning-teaching process category the most common code was “able to use digital technologies”, and under personal characteristics category the most common code was “able to communicate effectively”. Examples of teacher candidates’ views on the code with the highest frequency in each category are as follows:

S2: 21st century teachers must prepare students for life. They should guide students in the subjects they need and train them in accordance with the digital age.

S4: The 21st century teacher is expected to have an adequate grasp of the subject field and to know the concepts, principles, and generalizations in the subject field.

S5: In order for the 21st century teacher to provide maximum benefit to his students, he or she should be in cooperation with his or her colleagues.

S9: It is very important for teachers to organize social, cultural, and sports activities for their students and to support their participation in these activities.

S12: The sharing of knowledge, feelings, and thoughts between the teacher and the student is the prerequisite for raising students. A good 21st century teacher must have effective communication skills.

The views of the participants were examined and the findings are shown in Table 5.

Table 5. *Views of the participants on the concept of 21st century student*

Theme	Category	Code	f
21st century student	Cognitive domain	Ability to do research	10
		Ability to adapt their knowledge to different situations	9
		Good use of technology	9
		Have problem-solving skills	8
		Have critical thinking skills	8
		Have creative thinking skills	7
	Affective domain	Open to innovation	9
		Sociable	8
		Willing to learn	7
	Socio-cultural domain	Collaborative	9
		Sensitive to social problems	8
		Have communication skills	7
		Have humanitarian and moral values	5

Table 5 shows that the views of the participants on the concept of a 21st century student are grouped into three different categories. Under the cognitive field category, the most common code was "ability to do research", under the affective domain category, the most common code was "open to innovation", and under the socio-cultural domain category, the most common code was "collaborative". Example views of teacher candidates on the most frequent codes in each category are as follows:

S3: In the information age we live in, it is not possible to provide the students with all the information they need from their teachers, families, or anyone else. 21st century students should be able to access the information and do research.

S8: The 21st century student should be open to learning new things and be willing to try different methods. They must be able to adapt easily to innovations.

S10: 21st century students should be able to work together with others for a common purpose. In this way, they will learn both to be a part of a group and to fulfill their individual responsibilities within the group.

The metaphors and their reasons that the participants created for the concept of the 21st century teacher were examined and the findings are shown in Table 6.

Table 6. *The metaphors created by the participants*

Participant Code	Created Metaphor	Reasons
S1	Brain	Because he or she "guides the students."
S2	Navigation	Because he/she "shows all the ways to go, puts the road map in front of the student, and leaves the choice of which way to go to the student."
S3	Sculptor	Because he or she "shapes his or her students to leave a beautiful work."
S4	Sun	Because "with his or her guidance, he or she illuminates the path of all students."
S5	Guide	Because he or she "gives direction to students".
S6	iPhone	Because it "is necessary to constantly update his or her knowledge with the developments in technology."
S7	Navigation	Because he or she "guides students to reach their goals."
S8	Navigation	Because he or she "is the guide that enables the goal to be reached."
S9	Compass	Because he or she "helps students find their way."
S10	Student	Because he or she "constantly works and updates its knowledge in order to be useful to its students."
S11	Architect	Because he or she "is productive and innovative."
S12	Flashlight	Because he or she "sheds light on his or her students on the way they will go."

Table 6 shows that participants have developed a total of 10 types of metaphors for the concept of a 21st century teacher. The metaphor that teacher candidates mentioned the most about the concept of the 21st century teacher is navigation. Other metaphors developed are: brain, sculptor, sun, guide, iPhone, compass, student, architect, and flashlight. All of the metaphors developed are concrete. It is also seen that metaphors are associated with guiding, updating knowledge, being productive, and being innovative.

The metaphors and their reasons that the participants created for the concept of the 21st century student were examined and the findings are shown in Table 7.

Table 7. *The metaphors created by the participants*

Participant Code	Created Metaphor	Reasons
S1	Detective	Because he or she "constantly researches, questions, and evaluates."
S2	Sapling	Because he/she "needs the attention and support of his/her family and teachers, and thus he/she develops."
S3	Robot	Because he or she "does the tasks assigned to him or her."
S4	Sapling	Because “if the environment and interest he/she needs are provided, he/she develops and becomes beneficial to humanity as it develops.”
S5	Camera	Because he or she "records every word and behavior he or she sees in his or her mind."
S6	Hard disk	Because he or she "quickly records information in his or her mind and uses it whenever he or she needs it."
S7	Play dough	Because "what is taught is shaped by attitudes."
S8	Computer	Because he or she "processes the information taught to him or her and stores it for use when needed."
S9	Hard disk	Because "a lot of information can be loaded into his or her mind."
S10	Robot	Because he or she "performs the tasks requested from him or her like a programmed device."
S11	Race horse	Because he or she "struggles to achieve the goals set for him or her."
S12	Race horse	Because he or she "has to constantly take exams and is in a struggle with his or her friends."

Table 7 shows that participants have developed a total of eight types of metaphors for the concept of a 21st century student. The metaphors that participants stated most about the concept of ethics are sapling, robot, hard disk, and race horse. Other developed metaphors are detective, camera, play dough, and computer. All of the metaphors developed are concrete. In addition, it is seen that metaphors are related to developing, being able to load lots of information into the mind, fulfilling what is expected of them, and being in constant struggle.

4. Discussion, Conclusion, and Recommendations

In this study, we examined the effect of the teaching practice course on gaining 21st century teacher skills for pedagogical formation group teacher candidates. We also examined their views on the course, the 21st century teacher, the 21st century student, and the metaphors created regarding these.

Teaching practice is an important element of the final study and training program that teacher candidates carry out in schools within the framework of faculty-school cooperation (Paker, 2008). A teaching practice course is very important in terms of enabling the training of qualified teachers. The practice process is a concrete indicator of the competencies of teacher candidates in terms of content knowledge, professional knowledge, general culture, and general skills. We found that the teaching practice course is effective in gaining 21st century teacher skills for teacher candidates. We can evaluate this result as teacher candidates enrolled in the pedagogical formation program can gain teaching skills, apply these skills in their professional lives, and provide 21st century learners with the education they need after completing the program. Research studies in the literature also indicate the significance of the teaching practice course in the education of teacher candidates (Ben-Peretz, 2001; Tang, 2003). These results also support our qualitative findings. Teacher candidates were asked for their views on the contribution of the teaching practice course. According to findings, the views of the participants on the contributions of the teaching practice course were collected under the codes of “professional knowledge”, “professional skills”, and “attitudes and values”. Under the "professional knowledge" category, the following codes are found: "method and technical knowledge", "examination of the curriculum", "legislation information on the teacher profession", and "rights and responsibilities of education stakeholders". Under the "professional skills" category, the following codes are found: "ability to prepare lesson plans,", "ability to use suitable methods and techniques", "ability to prepare assessment and evaluation tools suitable on purpose", "ability to make process- and result-oriented assessments and evaluations", "ability to use communication and information technologies", "ability to prepare teaching material", and "enabling students to actively participate in lessons". Under the “attitude and values” category, the following codes are found: “paying attention to effective communication”, “being tolerant of individual and cultural differences, “willingness to share with colleagues”, “acting in accordance with professional ethical principles”, “adopting the understanding that every student can learn, and “adopting the importance of raising students in accordance with national and universal values”.

These findings offer an opportunity to deeply analyze the perspectives of teacher candidates regarding the contributions of the teaching practice course. By considering these findings, we can better understand how teacher candidates perceive and evaluate different aspects of the teaching practice course.

First and foremost, the viewpoints categorized under the "Professional Knowledge" codes illustrate how essential professional knowledge elements such as subject knowledge, methods and techniques, and legal knowledge are developed through this course. These results indicate that the teaching practice course effectively enhances the professional knowledge level of teacher candidates.

The codes within the "Professional Skills" category reflect how the course shapes the practical skills of teacher candidates, including lesson planning, instructional methods, material utilization, and assessment processes. These outcomes demonstrate that the teaching practice course equips teacher candidates with effective preparation for planning and conducting their lessons.

The codes in the "Attitudes and Values" category showcase how teacher candidates focus on broader values such as ethical behavior, communication skills, and sensitivity to diversity. These results reveal that the teaching practice course contributes to teacher candidates' adoption of professional and ethical values.

In general, these findings underscore the significant role of the teaching practice course in enhancing the professional knowledge, skills, and values of teacher candidates. It can be inferred that this course has a positive impact on preparing teacher candidates for their future teaching careers.

In the academic literature, it is also noted that teacher candidates embrace ethical behavior, respect for student diversity, and values such as equality and justice during their teaching practice courses. These courses play a crucial role in developing teacher candidates' professional ethics and social responsibilities (Cochran-Smith & Zeichner, 2005; Zeichner, 2012).

Similar to our study, Aslan & Sağlam (2017) stated that the teaching practice course is seen as a course that should be included in teacher education in terms of improving professional skills. Eryılmaz Ballı et al. (2018) stated in their study that teacher candidates' desire to become teachers and their awareness of the profession increased, their self-confidence improved, and they learned to fulfill the requirements of the profession thanks to the experiences they had at the practice school. Eskici (2020) stated in his research that thanks to the teaching practice course, teacher candidates acquired improvements such as communication skills with students, experience, finding the opportunity to practice, seeing their deficiencies, and problem-solving skills. Different studies in the literature have revealed that effective teaching practices contribute to teacher development and education (Beck & Kosnik, 2002; Brooks, 2006; Darling-Hammond, 2006; Feiman-Nemser, 2001; Lee et al., 2012).

In this study, findings show that teacher candidates developed 10 different metaphors for the concept of the 21st century teacher. The stated concepts for the 21st century teacher were navigation, brain, sculptor, sun, guide, iPhone, compass, student, architect, and flashlight. All of the metaphors developed are concrete concepts. The metaphors mentioned by teacher candidates indicate their attempt to express the role of a 21st century teacher in concrete and identifiable ways. The diversity of these metaphors can reflect the complexity and multidimensionality of the teaching profession. Evaluating the reasons for creating these metaphors, we see that there is an emphasis on guiding, updating knowledge, being productive, and being innovative. The emphasis on common themes such as guidance, mentorship, updating knowledge, productivity, and innovation in these metaphors can be explained in relation to the necessity for 21st century teachers to possess multifaceted skills. We also asked the teacher candidates about their views on 21st century teachers to analyze their perceptions. Views of participants on the concept of the 21st century teacher were grouped under the categories of "student development", "subject area and field education", "cooperation", "social-environmental dimension", and "personal characteristics" (Table 4). The emerging categories demonstrate that teacher candidates depict the 21st century teacher by grounding their explanations in diverse fields and skills, highlighting the multidimensional nature of the teaching role. The content of these categories reveals that teacher candidates emphasize multiple roles of the 21st century teacher, encompassing not only academic content but also supporting student development, collaborating, and considering societal and environmental influences, indicating that the teacher's role today extends beyond being a mere transmitter of knowledge to encompass broader societal and individual impact.

21st century teachers should be competent to prepare students for the future in an information-technology society. In this period when technology is advancing rapidly, teachers' failure to update their knowledge, not using different methods and techniques, and not integrating technology into the education process will not be enough for the children of this age and will not attract their attention. Therefore, 21st century teachers should be aware of this situation, be able to renew and develop themselves according to the characteristics of children of this age, and have 21st century teaching skills.

As a result of the updates made by the Ministry of National Education of Turkey (MEB) regarding the teaching profession competency studies, 21st century teacher skills were considered "professional skills", "professional knowledge" and "attitudes and values". Under the field of professional skills, creating learning environments, teaching planning, managing the learning and teaching process, and evaluation and assessment subfields are found. Under the heading of professional knowledge, field training knowledge, field knowledge, and legislative knowledge subfields are found. Finally, under the field of attitudes and values, approach to students, national, spiritual, and universal values, personal and professional development, and communication and cooperation subfields are found (MEB, 2017). The International Education Standards Association, on the other hand, stated that teachers should have some standards in the current century. They have defined the standards for these teachers as individuals who are learning, creative, leading their students, cooperating with both their students and colleagues, being citizens who enable their students to contribute to the digital world, analyzing the data in their hands, and facilitating learning with technology (ISTE, 2015).

Participants developed eight different metaphors for the concept of a 21st century student. These metaphors are defined as sapling, robot, hard disk, race horse, detective, camera, play dough, and computer. All of the metaphors developed are concrete concepts. Evaluating the reasons for the creation of these metaphors, we see that the emphasis is on developing, being able to load a lot of information into the mind, fulfilling what is expected of them, and being in constant struggle. The metaphors constructed by teacher candidates provide a

creative approach to understanding and supporting various aspects of students. These metaphors can serve as tools for teachers to better guide students and bring out their potential, enabling them to offer effective guidance and bring out the best in their students. In the study, the views of participants on the concept of a 21st century student were also consulted. The views of participants on the concept of the 21st century student were grouped under the categories of "cognitive domain", "affective domain", and "socio-cultural domain" (Table 5). The resulting categories show that teacher candidates explain the concept of the 21st century student based on different areas of development. Teacher candidates focused on different skills and characteristics within each development area. The results show that in today's information society, the ability of individuals to adapt their knowledge to different situations, to conduct research, to use technology well, to solve problems, to think creatively, and to think critically are among the most necessary skills for students. Being assertive, open to innovation, and willing to learn are considered critical skills for every learner. In addition, the competencies of being sensitive to social problems, working collaboratively, having humane and moral values, and having communication skills are also gaining importance.

Wagner (2008) lines up skills that 21st century learners should have as accessing and analyzing information, problem solving and critical thinking, cooperation and leadership between systems and people, effective written and verbal communication, agile intelligence and adaptability, and curiosity and imagination. He stated that these skills are of vital importance in the 21st century and used the expression "survival skills" for them.

The International Educational Technologies Society has explained the skills that it considers necessary for 21st century learners under seven headings: digital citizen, competent learner, computational thinker, innovative designer, knowledge builder, creative communicator, and global collaborator (ISTE, 2016). In addition, the OECD (2018), with the DeSeCo (Definition and Selection of Competencies) project, discussed the skills that the learners of the new millennium should have in 2030 under transformative competencies and expressed these three titles as taking responsibility, coping with difficulties and tensions, and creating new values.

In the project called "Partnership for 21st Century Learning (P21)" implemented in many states in the United States, the skills that 21st century learners should have are identified as: media-information and technology skills (media literacy, information literacy, and technology literacy); career and life skills (resilience and adaptability; social and intercultural skills; leadership and responsibility; entrepreneurship and self-direction; productivity and accountability); and innovation and learning skills (communication, creativity and innovation; cooperation; problem solving; and critical thinking) (P21, 2019). These diverse sources emphasize the importance of learners not only possessing academic knowledge but also having skills that they can use in practical life, excel in social interactions, and effectively utilize technology. In line with this, the education system and instructional approaches should support learners in developing these multifaceted skills.

As a result of the research results and the literature review,

- The study revealed the effectiveness of teaching practice courses in equipping teacher candidates with 21st century teaching skills. In this regard, it is suggested that the content, methods, and assessment processes of teaching practice courses be reviewed and enhanced to make them more impactful.
- In order for the pedagogical formation group teacher candidates to benefit from the teaching practice process at the highest level and to be equipped with 21st century skills, we believe that the teaching practice process should be spread over a longer period of time.
- The results obtained from the research show that the teaching practice course contributes to the 21st century teaching skills of teacher candidates. Therefore, teaching the teaching practice process in undergraduate programs not only in the last year of undergraduate education but also in all undergraduate programs will contribute to teacher candidates.
- Undergraduate programs at higher education institutions should be planned with 21st century skills in mind.
- The results of the study indicate that teacher candidates value student-centered and personalized learning approaches. In line with this, it is recommended to adopt versatile teaching approaches (such

as project-based learning and design thinking) in teacher education and encourage teacher candidates to implement these approaches.

- Universities should consistently maintain activities aimed at enhancing teacher candidates' 21st century teaching skills.
- MEB should regularly organize professional development programs and workshops to empower teachers with 21st century teaching skills.
- MEB could establish support and monitoring mechanisms in schools to enable teachers to put their 21st century teaching skills into practice. Mentorship programs, educational coaches, or expert educators could provide individual guidance and feedback to teachers, thereby supporting the effective implementation of these skills.
- To help teacher candidates better understand their teaching identities and how they acquire 21st century teaching skills, implementing self-assessment practices could be recommended.
- This study targeted pedagogical formation group teacher candidates. Similar studies could be conducted on different groups of teacher candidates (e.g., science, social studies, and mathematics teacher candidates) to generalize the findings.

5. References

Araujo, M. C., Carneiro, P., Cruz-Aguayo, Y., & Schady, N. (2016). Teacher Quality and Learning Outcomes in Kindergarten. *The Quarterly Journal of Economics*, *131*(3), 1415–1453. https://doi.org/10.1093/qje/qjw016

Aslan, M., & Sağlam, M. (2017). Evaluation of Teaching Practice Course According to Opinions of Student Teachers. *Hacettepe University Journal of Education*, 1–19. https://doi.org/10.16986/HUJE.2017030313

Astuti, A. P., Aziz, A., Sumarti, S. S., & Bharati, D. A. L. (2019). Preparing 21st Century Teachers: Implementation of 4C Character's Pre-Service Teacher through Teaching Practice. *Journal of Physics: Conference Series*, *1233*(1). https://doi.org/10.1088/1742-6596/1233/1/012109

Bashir, S., Bajwa, M., & Rana, S. (2014). Teacher As a Role Model and Its Impact on the Life of Female Students. *International Journal of Research -GRANTHAALAYAH*, *1*(1), 9–20. https://doi.org/10.29121/granthaalayah.v1.i1.2014.3081

Bayat, S., & Öztürk, T. (2017). A Micro-Teaching Practice Sample in Teaching of First Reading and Writing Course. *Journal of Bayburt Education Faculty*, *12*(23). https://dergipark.org.tr/tr/download/article-file/326109

Beck, C., & Kosnik, C. (2002). Components of a Good Practicum Placement: Student Teacher Perceptions. *Teacher Education Quarterly*, *29*(2), 81–98. https://eric.ed.gov/?id=EJ651382

Ben-Peretz, M. (2001). The impossible role of teacher educators in a changing world. *Journal of Teacher Education*, *52*(1), 48–56. https://doi.org/10.1177/0022487101052001005

Brooks, V. (2006). A "quiet revolution"? The impact of Training Schools on initial teacher training partnerships. *Journal of Education for Teaching*, *32*(4), 379–393. https://doi.org/10.1080/02607470600981979

Burroughs, N., Gardner, J., Lee, Y., Guo, S., Touitou, I., Jansen, K., & Schmidt, W. (2019). *Teaching for Excellence and Equity* (Vol. 6). Springer International Publishing. https://doi.org/10.1007/978-3-030-16151-4

Cochran-Smith, M., & Zeichner, K. M. (2005). Studying teacher education: the report of the AERA Panel on Research and Teacher Education. In *Choice Reviews Online* (Vol. 43, Issue 04). Routledge. https://doi.org/10.5860/choice.43-2338

Creswell, J. W., & Plano-Clark, V. L. (2007). Designing and Conducting Mixed Methods Research. In *Australian and New Zealand Journal of Public Health* (Vol. 31, Issue 4). SAGE Publications Inc.

Creswelll, J. W. (2012). *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research* (4th ed.). Boston, MA: Pearson Education.

Darling-Hammond, L. (2006). Constructing 21st-Century Teacher Education. *Journal of Teacher Education*, *57*(3),

300–314. https://doi.org/10.1177/0022487105285962

Ertmer, P. A., Ottenbreit-Leftwich, A., & Tondeur, J. (2016). Teacher Beliefs and Uses of Technology to Support 21st Century Teaching and Learning. In H. Fives & M. G. Gill (Eds.), *Handbook of Research on Teachers' Beliefs*.

Eryılmaz Ballı, F., Müldür, M., & Büyükkarcı, A. (2018). Opinions of Prospective Teachers Have Pedagogical Formation Education About Teaching Practice II Course. *Mediterranean Journal of Educational Research*, *12*(25), 301–325. https://doi.org/10.29329/mjer.2018.153.16

Eskici, M. (2020). Öğretmen yetiştirme sürecinin bir parçası: Öğretmenlik uygulaması. *6th International Strategic Researches Congress*.

Fábián, G. (2013). The Application of Improved Metaphor Analysis in Education Research. *Procedia - Social and Behavioral Sciences*, *93*, 1025–1029. https://doi.org/10.1016/j.sbspro.2013.09.323

Feiman-Nemser, S. (2001). From preparation to practice: Designing a continuum to strengthen and sustain teaching. *Teachers College Record*, *103*(6), 1013–1055. https://doi.org/10.1111/0161-4681.00141

Flick, U. (2014). The SAGE handbook of qualitative data analysis. In *The SAGE Handbook of Qualitative Data Analysis*. London: Sage. https://doi.org/10.4135/9781446282243

Forceville, C. (2002). The identification of target and source in pictorial metaphors. *Journal of Pragmatics*, *1*(14), 1–14. https://doi.org/10.1016/S0378-2166(01)00007-8

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How to Design and Evaluate Research in Education*. New York: McGraw-Hill.

Göksün, D. O., & Kurt, A. A. (2017). The Relationship Between Pre-Service Teachers' Use of 21st Century Learner Skills and 21st Century Teacher Skills. *Education and Science*, *42*(190), 107–130. http://egitimvebilim.ted.org.tr/index.php/EB/article/view/7089

İncik Yalçın, E. (2020). Investigation of the Relationship Between Teachers' Lifelong Learning Tendencies and 21st Century Teacher Skills. *Bolu Abant Izzet Baysal University Journal of Faculty of Education*.

ISTE. (2015). *ISTE Standarts: Educators*. https://www.iste.org/standards/iste-standards-for-teachers

ISTE. (2016). *ISTE Standards: Students*. http://bit.ly/1JaMZMU

Jan, H. (2017). Teacher of 21st Century: Characteristics and Development. *International Knowledge Sharing Platform*, *7*(9), 50–54.

Johnson, R. B., & Christensen, L. (2019). *Educational research: quantitative, qualitative, and mixed approaches* (7th ed.). SAGE Publications, Inc.

Karabekmez, V. (2021). *The relationship between primary school teachers' 21st century teacher skills and critical thinking skills*. Master's Thesis, Elazığ, Fırat University.

Kıyasoğlu, E. (2019). *21st Century Learning and Teaching Skills of Classroom Teachers*. Master Thesis, Duzce: Duzce University.

Kıyasoğlu, E., & Çeviker Ay, Ş. (2020). What Are the Views of Classroom Teachers on Their Levels of Using 21st Century Learner and Teacher Skills? *E-Kafkas Journal of Educational Research*. https://doi.org/10.30900/kafkasegt.689976

Kozikoğlu, İ., & Özcanlı, N. (2020). The Relationship between Teachers' 21st Century Teaching Skills and Their Engagement to the Profession. *Cumhuriyet International Journal of Education*. http://cije.cumhuriyet.edu.tr/tr/pub/issue/53201/579925

Lee, J., Tice, K., Collins, D., Melton, J., Brown, A. L., & Fox, J. (2012). Assessing student teaching experiences: Pre-service teachers' perceptions of their preparedness and efficacy. *Educational Research Quarterly*, *36*, 3–19. https://eric.ed.gov/?id=EJ1061946

Lemov, D. (2010). *Teach like a champion: 49 techniques that put students on the path to college*. Josey-Bass Teacher.

https://doi.org/10.5860/choice.48-2815

Lunenberg, M., Korthagen, F., & Swennen, A. (2007). The teacher educator as a role model. *Teaching and Teacher Education*, *23*(5), 586–601. https://doi.org/10.1016/j.tate.2006.11.001

Marshall, C., Rossman, G. B., & Blanco, G. L. (2021). *Designing qualitative research* (7th ed.). SAGE Publications, Inc.

MEB. (2008). *Öğretmen Yeterlikleri: Öğretmenlik Mesleği Genel Ve Özel Alan Yeterlikleri 2. Parça*. Devlet Kitapları Müdürlüğü.

MEB. (2017). *Öğretmenlik mesleği genel yeterlilikleri*. https://oygm.meb.gov.tr/dosyalar/StPrg/Ogretmenlik_Meslegi_Genel_Yeterlikleri.pdf

Melvin, L. (2011). *How to keep good teachers and principals : practical solutions to today's classroom problems*. R&L Education.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Sage Publications.

OECD. (2018). The Future of Education and Skills: Education 2030. In *OECD Education Working Papers*. http://www.oecd.org/education/2030/E2030 Position Paper (05.04.2018).pdf

Orhan Göksun, D. (2016). *The Relationship Between Pre-Service Teachers' Use of 21st Century Learner Skills and 21st Century Teacher Skills*. Doctoral Thesis, Eskisehir: Anadolu University.

P21. (2019). *Framework for 21st Century Learning Definitions*. https://static.battelleforkids.org/documents/p21/P21_Framework_DefinitionsBFK.pdf

Paker, T. (2008). Problems of Student Teachers Regarding The Feedback of University Supervisors and Mentors During Teaching Practice. *Pamukkale University Journal of Education*, *1*(23). https://dergipark.org.tr/tr/pub/pauefd/issue/11120/132984

Palfrey, J., & Gasser, U. (2008). *Born digital: Understanding the first generation of digital natives*. New York: Basic Books.

Patton, M. Q. (2014). Qualitative research & evaluation methods. In *Sage* (4th ed.). SAGE Publications, Inc. https://doi.org/10.1590/s1415-65552003000200018

Rusdin, N. M. (2018). Teachers' Readiness in Implementing 21st Century Learning. *International Journal of Academic Research in Business and Social Sciences*, *8*(4). https://doi.org/10.6007/ijarbss/v8-i4/4270

Sanders, W. L., & Rivers, J. C. (1996). *Cumulative and Residual Effects of Teachers on Future Student Academic Achievement*. https://www.beteronderwijsnederland.nl/files/cumulative and residual effects of teachers.pdf

Shukla, S. (2014). Teaching Competency, Professional Commitment and Job Satisfaction-A Study of Primary School Teachers. *IOSR Journal of Research & Method in Education (IOSRJRME)*, *4*(3), 44–64. https://doi.org/10.9790/7388-04324464

Sirait, S. (2016). Does Teacher Quality Affect Student Achievement? An Empirical Study in Indonesia. *Journal of Education and Practice*, *7*(27), 34–41. https://eric.ed.gov/?id=EJ1115867

Struyk, L. R., & McCoy, L. H. (1993). Pre-Service Teachers' Use of Videotape for Self-Evaluation. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, *67*(1), 31–34. https://doi.org/10.1080/00098655.1993.9956012

Tang, S. Y. F. (2003). Challenge and support: The dynamics of student teachers' professional learning in the field experience. *Teaching and Teacher Education*, *19*(5), 483–498. https://doi.org/10.1016/S0742-051X(03)00047-7

Tschannen-Moran, M., & Barr, M. (2004). Fostering Student Learning: The Relationship of Collective Teacher Efficacy and Student Achievement. *Leadership and Policy in Schools*, *3*(3), 189–209. https://doi.org/10.1080/15700760490503706

Utami, P., Cikarge, G. P., Ismail, M. E., & Hashim, S. (2018). Teaching Aids in Digital Electronics Practice through Integrating 21st Century Learning Skills using a conceptual approach. *Journal of Physics: Conference Series*, *1140*(1). https://doi.org/10.1088/1742-6596/1140/1/012022

van Manen, M. (2016). Phenomenology of Practice. *Phenomenology of Practice*. https://doi.org/10.4324/9781315422657

Wagner, T. (2008). *The Global achievement gap : Why even our best schools don't teach the new survival skills our children need--and what we can do about it*. Basic Books.

Wayne, A. J., & Youngs, P. (2003). Teacher characteristics and student achievement gains: A review. *Review of Educational Research*, *73*(1), 89–122. https://doi.org/10.3102/00346543073001089

YÖK. (2021). *Uygulama öğrencilerinin Milli Eğitim Bakanlığına bağlı eğitim öğretim kurumlarında yapacakları öğretmenlik uygulamasına ilişkin yönerge*. http://mevzuat.meb.gov.tr/dosyalar/1961.pdf

Zeichner, K. (2012). The Turn Once Again Toward Practice-Based Teacher Education. *Journal of Teacher Education*, *63*(5), 376–382. https://doi.org/10.1177/0022487112445789

Zheng, H., & Song, W. (2010). Metaphor Analysis in the Educational Discourse: A Critical Review. *US-China Foreign Language*, *8*(9), 42. https://eric.ed.gov/?id=ED514704