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The Relationship Between 21st-century Teacher Skills and Critical Thinking Skills of Classroom Teacher*

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ABSTRACT

This study aims to investigate the relationship between 21st- century teacher skills and critical thinking skills in the classroom teachers. The sample of the study consisted of classroom teachers working in a southeastern city in Turkey. A correlational survey model was used in the study. The 21st-century Teacher Skills Use Scale and the Critical Thinking Scale were used for data collection. The results showed that classroom teachers generally agreed with the statements of the 21st-century Teacher Skills Use Scale and the subscales of technopedagogical skills, flexible teaching skills and confirmative skills, while they always agreed with the subscales of administrative skills and confirmative skills. There was no significant difference between participants' use of 21st-century teacher skills in terms of gender and professional experience. Teachers indicated that they agreed with the statements on the Critical Thinking scale and the Assessment, Self-Control, Self-Regulation, and Self-Confidence subscales and fully agreed with the Decision Making subscale. Although there was no significant difference between critical thinking ability and gender, a significant difference was found between teachers' critical thinking ability and their professional experience. In addition, a positive and moderately significant relationship was found between the use of 21st-century teacher competencies and critical thinking skills in all dimensions. The results indicated that the level of 21st-century skills increased as teachers' critical thinking skills increased.21st-century 21st-century 21st-century 21st-century that the levels of 21st-century skills increased as teachers' critical thinking skill levels increased.

Keywords:
21 st- century teacher skills, critical thinking skills, primary school teaching

1. Introduction

In today's world, the countries willing to be more democratic, successful and developed than others need to educate generations having the required skills of the 21st century. In this sense, a learning and teaching environment appropriate for the 21st-century and teachers need these skills. With the changing conditions, a change in the education system and the roles of the teachers within this system also takes place. The development of a country can be enhanced by having qualified human resources. For the new generation to be qualified, the existing education system should be reorganized in the light of the needs of today and the future (Gökçe, 2000). According to Kıyasoğlu (2019), the teacher-centred education system has been replaced by a student-centred education system in the past. In terms of 21st-century skills, teachers are expected to guide and support their students' production readiness, curiosity, problem-solving skills, and critical thinking. 21st-century skills are divided into three main themes: learning and innovation, knowledge, technology and media skills, and life and career skills (Partnership for 21st Century, 2015). Today, everyone

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need to have all of these 21st-century skills (Hamarat, 2019). This can only be possible with a learning and teaching environment based on 21st-century knowledge and skills (Korkmaz, 2019). According to Louis (2012), the development of 21st-century skills will also contribute positively to the future of students.21st-century 21st-century Therefore, learning methods and strategies addressing the 21st-century should be encouraged. In addition, students should be provided with skills such as communication, collaboration, problem solving, critical thinking and productivity.

In the modern world, rote learning and monotony are out of the educational agenda now, and instead education aims at productivity, productivity and critical thinking. To educate individuals having critical thinking skills, teachers who will train these individuals should also possess these skills. Features such as establishing relationships with people, not being prejudiced about an issue, exploring original ideas, questioning and doubting events and facts are indicators of critical thinking (Alkın & Gözütok, 2013). According to Akdemir (2019), as we live in an age in which knowledge develops and changes rapidly, individuals, who are required to adjust to this dramatic change, should be able to come up with different solutions and use high-level cognitive activities. In other words, they should have critical thinking skills. In this sense, teachers who deliver educational services have to possess critical thinking skills to develop these skills among their students. Therefore, teachers play a significant role in developing critical thinking (Paul & Elder, 2005; Şahinel, 2002; Zincirli, 2014). A teacher with critical thinking skills should primarily be unbiased, patient, receptive to all kinds of innovations, and able to think in varied ways. The teachers willing to increase their productivity should organize all the tools and materials within their reach in accordance with critical thinking skills (Güzel, 2005). In the process of teaching critical thinking, teachers should always encourage students to discuss and question the information they suspect (Şahinel, 2002). The teachers should make sure that the communication in the classroom is clear and simple without imposing their own opinions on the students. They should help students be able to think critically, create appropriate environments for critical thinking, actively participate in the activity, and develop a more advanced level of critical thinking ability (Bingöl, 2019).

Teachers have the most important responsibility at every stage of the education process, from primary school to higher education, in developing 21st-century skills, which play an important role in the development of students' future life and career (Anagün, Atalay, Kılıç & Yaşar, 2016). The person who teaches 21st-century skills should be a leader, ensure permanent learning, organize the environment and materials, and cooperate with every individual who has an impact on education (Melvin, 2011). Besides, the competencies of the 21st-century skills that teachers and students have will surely have an impact on each other (Sanders & Rivers, 1996). According to Belet- Boyacı & Özer (2019), the classifications of 21st-century skills consist of critical thinking, problem-solving and productivity.Especially primary school plays a significant role in developing the foundation of critical thinking skills, which can be called a vital skill (Silva, 2009). Literatürde 21. There are studies on 21st-century skills in the literature (Ainley & Luntley,2007; Bunker,2012; Eğmir & Çengelci, 2020; Noise, Aslan & Alcı, 2018; Noise, Aslan & Alcı, 2018; İncik-Yalçın ,2020; Korkmaz, 2019; Kozikoğlu & Özcanlı, 2020; Miller & Pedro, 2006, Orhan-Göksün, 2016).Considering that critical thinking skills are important for the teaching profession (Ağdacı,2018; Akdemir, 2019; Aliakbaria & Sadeghdaghighib, 2012; Arslan, 2016; Aslan, 2019; Palavan, Gemalmaz & Kurtoğlu, 2015; Recalde,2008; Şengül&Üstündağ , 2009), studies have been conducted with teachers from different disciplines in which critical thinking is investigated together.Today, teachers are required to have both 21st-century skills and critical thinking skills. Teaching 21st-century and critical thinking skills from the beginning facilitates monitoring students' development. Thus, it is of crucial importance for classroom teachers to have these two skills. Therefore, classroom teachers' use of 21st-century teacher skills and critical thinking skill levels and the effect of critical thinking skills on 21st-century teacher skills should be examined. To bridge this gap, this study aims at investigating the relationship between 21st-century teacher skills and critical thinking skills of classroom teachers. Research Questions:

- What are the levels of classroom teachers' 21st-century teacher skills use and critical thinking skills?
- Is there a significant difference between classroom teachers' 21st-century teacher skills use and critical thinking skills and demographic characteristics (gender and work experience)?
- What level of relationship is there between classroom teachers' 21st-century teacher skills use and critical thinking skills?

2. Method

2.1. ResearchModel

The quantitative research method was employed in the present study which was carried out to investigate classroom teachers' 21st-century teacher skills level and critical thinking skills. To do so, correlational survey design, one of the quantitative research methods, was used in the present study. According to Fraenkel and Wallen (2009), correlational survey design is a research model that aims to determine the presence and/or degree of change between two or more variables.

2.2. Population and Sample

The research population consisted of all classroom teachers working in a southeastern city in Turkey in the 2019-2020 academic year. The research sample was made up of 359 classroom teachers working in public schools. During the data collection stage, a convenience sampling method was adopted. Convenience sampling provides easy access to more participants in quantity and saves time during data collection (Büyüköztürk, Çakmak, Akgün, Karadeniz & Demirel, 2018). The classroom teachers were included in the study for the two reasons. First, they teach 21st-century skills and critical thinking skills to young learners, which makes monitoring the development of these skills easier. Second, they have an adequate amount of classroom time and free activities to teach these skills. Therefore, the level of 21st-century teacher skills of classroom teachers and whether critical thinking skills have an influence on 21st-century teacher skills were investigated in this study.

Table 1. *The distribution of the participants concerning demographic variables*

Demographic Variables	*Groups*	*Frequency*	*Percentage*
Gender	Male	209	58.2
	Female	150	41.8
	Total	359	100
Work Experience (year)	1-5	88	24.6
	6-10	106	29.5
	11-15	86	24.0
	16-20	43	12.0
	21+	36	10.0
	Total	359	100

As shown in Table 1, 58.2% of the participants were men and 41.8% were women. 24.6% of them had 1-5 years of work experience, 29.5% had 6-10 years of work experience, 12.0% had 16-20 years of work experience, and the remaining 10% had 21 years or more experience. These data show that the majority of the participants in the study were male, and most of them had 6-10 years of work experience.

2.3. Data Collection Tools

In selecting the data collection instruments, a literature review was first conducted to identify the scales suitable for the aim of the present study. Then, these scales were compared in terms of the constructs they measured, sub-dimensions, response time, timeliness and suitability for the research method. As a result, two scales were determined and used in the research: 21st-century Teacher Skills Use Scale and Critical Thinking Scale.

2.3.1. Personal Information Questionnaire

The variables of this study that are gender and work experience were determined with the Personal Information Questionnaire prepared by the researchers.

2.3.2. 21st-century Teacher Skills Use Scale

21st-century Teacher Skills Use Scale was developed by Orhan-Göksün (2016) and consists of 27 items scored on a five-point Likert type scale.There are 5 responses in the scale as "never", "rarely", "sometimes", "usually" and "always" and they are scoredfrom 1 to 5. The Cronbach's alpha value of the total scale was calculated as 0.979. The highest score that can be obtained from the scale is 135 whereas the lowest score is 27. The 21st-century Teacher Skills Use Scale contains five sub-dimensions: administrative skills (Items 5, 8,

9,10, 11, 12, 15, 16, 17, 20, 21, and 25), technopedagogical skills (Items 6, 7, 19, 22, 23, 24, 26, and 27), confirmative skills (Items 4, 1, and 18), flexible teaching skills (Items 2 and 3), and productive skills (Items 13 and 14).Cronbach's alpha values were calculated for these sub-dimensions. The values were calculated as 0.856 for administrative skills, 0.716 for technopedagogical skills, 0.763 for confirmative skills, 0.821 for flexible teaching skills, and 0.581 for productive skills.

2.3.3. Critical Thinking Scale

To investigate the critical thinking skills of the participants, the Critical Thinking Scale, which was revised from Semerci's (2000) The Scale of Critical Thinking by Ağdacı (2018), was employed in the present study. The scale consists of 43 items scored on a five-point Likert type scale. Cronbach's Alpha value of the scale was calculated as 0.915. The highest score that can be obtained from the scale is 215, whereas the lowest score is 43. The scale consists of five sub-dimensions: decision-making (Items 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, and 37), self-regulation (Items 6, 7, 8, 9, 10, 11, 12, 13, and 14), self-confidence (Items 19, 38, 39, 40, 41, 42, and 43), assessment (Items 15, 16, 17, 18, 20, and 21), and self-control (Items 1, 2, 3, 4, and 5).

2.4. Data Collection and Analysis

Data were collected from classroom teachers through the Personal Information Questionnaire;the 21st-century Teacher Skills Use Scale and the Critical Thinking Scale in the 2019-2020 academic year. The data collection tools were distributed and collected electronically via online tools andin-person by visiting the schools.

Before investigating the relationship between the use of 21st-century teacher skills and critical thinking skills, the kurtosis and skewness values were examined to determine whether the data were normally distributed. The kurtosis and skewness values showed that the expected values of the scales were below the observed values. This meant that the significance value was less than 0.05. A normality test was performed to determine whether the data were normally distributed. It was found that both scales and their subscales had a significance value of less than 0.05. This finding showed that the data were not normally distributed. Therefore, non-parametric statistical tests were employed in the present study. According to Büyüköztürk (2018) the Mann-Whitney U test should be used for two independent samples and the Kruskal-Wallis H test for more than two independent samples when the normality assumption is not met. In this sense, the Mann-Whitney U test and Kruskal-Wallis H test, which are non-parametric statistical techniques, were used to examine 21st-century teacher skills and critical thinking skills concerning gender and work experience due to the unbalanced number of independent samples. In addition, a correlation analysis was performed to reveal whether there was a relationship between the levels of critical thinking and 21st-century teacher skills use

2.5. Ethical

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

Ethical Review Board Name: Fırat University Ethics Committee

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3. Findings

This section presents the findings of 21st-century teaching skill use and critical thinking skills of classroom teachers.

Table 2. *Scores of the 21st-century Teacher Skills Use Scale and Critical Thinking Scale*

	N	$\overline{X}$	*sd*
Administrative skills	359	4.02	.46
Technopedagogical skills	359	3.76	.45
Confirmative skills	359	4.56	.46
Flexible teaching skills	359	3.53	.80
Productive skills	359	3.90	.65
21st-century Teacher Skills	359	3.96	.41

Decision-making	359	4.02	.60
Self-regulation	359	4.14	.63
Assessment	359	4.10	.61
Self-confidence	359	4.23	.63
Self-control	359	4.20	.61
Critical Thinking Skills	359	4.19	.57

Table 2 shows that the mean 21st-century teacher skills score of the participants was 3.76. This finding revealed that the participants generally agreed with the statements on 21st-century teacher skills and had a moderate level of these skills. It was also found that participants had a mean score of 4.56 in the endorsing skills subscale, indicating that participants always agreed with the endorsing skills statements. This finding showed that the participants had a high level of confirmative skills in 21st-century teacher skill. The mean scores of the participants concerning other sub-scales of 21st-century teacher skills were as follows: Administrative Skills= 4.02, Productive Skills= 3.90, Technopedagogical Skills= 3.76 and Flexible Teaching Skills= 3.53. These findings indicated that participants' flexible teaching skills were at a lower level than the other skills.

The participants were found to have a mean score of 4.19 in the Critical Thinking Scale. This finding suggested that the participants agreed with the statements on Critical Thinking Skills scale and their critical thinking skills were almost at a high level. In addition, they had a mean score of 4.23 in the Self-Confidence sub-scale. This finding revealed that the participants completely agreed with the statements on Self-Confidence sub-scale and had a high level of self-confidence skills. The mean scores of the participants concerning other sub-scales of Critical Thinking Scales were as follows: Self-control= 4.20, Self-regulation= 4.14, Evaluation= 4.10, and Decision making= 4.02. These findings indicated that participants' decision making skills were at a lower level than the other critical thinking skills.

To examine whether there was a difference between the participants' 21st-century teacher skills use and critical thinking skills concerning gender, the Mann Whitney U test, one of the non-parametric tests, was used since data were not normally distributed. The findings of the Mann Whitney U test are presented in Table 3.

Table 3. *Mann Whitney U Test Results concerning the Effect of Gender on 21st-century Teacher Skills Use and Critical Thinking Skills*

Scale	*Gender*	*n*	*X*	*Sd*	*U*	*p*
21st-century Teacher Skills Use	Male	209	172.58	.392	14123.5	.109
	Female	150	190.34	.367		
Critical Thinking Skills	Male	209	177.09	.486	15066.5	.530
	Female	150	184.06	.492		

*p<0.05

Table 3 shows no statistically significant difference between male and female participants in terms of 21st-century teacher skills use and critical thinking skills. The effects of work experience on 21st-century teacher skills use and critical thinking skills are presented in Table 4.

Table 4. *The Effects of Work Experience on 21st-century Teacher Skills Use and Critical Thinking Skills*

Scale	Work Experience	n	$\bar{X}$	sd	Kruskal-Wallis H	P	MWU
21st-century Teacher Skills Use	A. 1-5	88	180.36	.380	5.955	.203	---
	B. 6-10	106	173.53	.359			
	C. 11-15	86	187.84	.367			
	D. 16-20	43	203.74	.434			
	E. 21+	36	151.08	.416			
Critical Thinking Skills	A.1-5	88	183.72	.553	10.653	.031*	B-C B-D
	B. 6-10	106	154.31	.437			
	C. 11-15	86	198.53	.491			
	D.16-20	43	198.01	.400			
	E. 21+	36	180.75	.512			

*p<0.05

As seen in Table 4, there was no statistically significant relationship between work experience and participants' 21st-century teacher skills use. However, it was found that the Critical Thinking Skills scores of the participants significantly differed by work experience (KWH= 10.653, p< .05).The difference was foundbetween participants with 6-10 years and 11-15 years of work experience, statistically in favor of the latter, and between participants with 6-10 years and 16-20 years of work experience, in favor of those with 16-20 years of work experience.

Table 5 presents the relationship between participants' 21st-century teacher skills use and critical thinking skills.

Table 5.*The Relationship Between 21st-century Teacher Skills Use and Critical Thinking Skills of the Participants*

	1. Administrative skills	2. Technopedagogical skills	3. Confirmative skills	4. Flexible teaching skills	5. Productive skills	6. 21st-century teacher Skills	7. Decision-making	8. Self-regulation	9. Assessment	10. Self-confidence	11. Self-control	12. Critical Thinking Skills
1.	1											
2	.648*	1										
3	.654*	.401*	1									
4	.469*	.319*	.288*	1								
5	.613*	.472*	.401*	.416*	1							
6	.944*	.797*	.672*	.572*	.671*	1						
7	.499*	.336*	.291*	.295*	.275*	.468*	1					
8	.451*	.297*	.295*	.270*	.269*	.435*	.796*	1				
9	.375*	.246*	.206*	.206*	.219*	.349*	.753*	.804*	1			
10	.463*	.352*	.261*	.292*	.323*	.452*	.814*	.727*	.720*	1		
11	.451*	.293*	.338*	.239*	.282*	.413*	.691*	.754*	.668*	.624*	1	
12	.509*	.342*	.312*	.309*	.303*	.446*	.941*	.916*	.864*	.876*	.798*	1

*p<0.01

Table 5 shows a moderate and significant positive correlation in all dimensions between the participants' 21st-century teacher skills use and critical thinking skills (r = 0.446, p <.01). This finding revealed that as the 21st-century skills use increased, their critical thinking skills also increased.

There was a moderate and significant positive relationship between the participants' 21st-century teacher skills use and decision making (r = 0.468 p <.01), self-regulation. (r = 0.435 p <.01), self-confidence (r = 0.452 p <.01) and self-control (r = 0.413 p <.01). In addition, a weak and significant positive relationship was found between the participants' 21st-century teacher skills use and assessment (r = 0.349 p <.01). Besides, it was also found that there was a moderate and significant positive relationship between the participants' critical thinking skills and administrative skills (r = 0.509 p <.01). Furthermore, there was a weak and significantly positive relationship between critical thinking skills of the participants and technopedagogical skills (r = 0.342 p <. 01), confirmatory skills (r = 0.312 p <.01), flexible teaching skills (r = 0.303) and productive skills (r = 0.312 p <.01). Finally, as shown in Table 5, the strongest relationship among sub-scales was between Administrative Skills and Decision Making (r = 0.446, p <.01). On the other hand, the weakest correlation was between Confirmatory Skills and Assessment sub-scales (r = 0.206, p <.01) and between Flexible Teaching Skills and Assessment sub-scales (r = 0.206, p <.01).

4. Conclusion and Discussion

This study aimed to examine teachers' use of 21st century skills and critical thinking skills of 359 teachers working in a southeastern city of Turkey in relation to their gender and work experience, and to examine whether there is a relationship between the use of 21st century skills and critical thinking skills.It was found in the present study that the participants' 21st-century teacher skills use was moderate. As a result, it can be concluded that classroom teachers' 21st-century teacher skills use at a level that will meet the needs of today's students and facilitate them to acquire 21st-century skills. In line with the findings of the present study, Gürültü, Aslan and Alcı (2018), Miller and Pedro (2006) and Orhan-Göksün (2016) reported that

teachers' 21st-century teacher skills were at a medium level. Similarly, pre-service teachers in Alkoç's study (2020) was found to have a moderate level of 21st-century skills. In addition, Gürültü, Etc. (2019), Eğmir and Çengelci (2020), Ainley and Luntley (2007), Korkmaz (2019), Kıyasoğlu (2019), Sanders and Rivers (1996), Bunker (2012), Kozikoğlu and Özcanlı (2020) and İncik-Yalçın (2020) found in their studies that teachers' 21st-century teacher skills use were at high or medium level. These findings in the literature support the results of the present study. The participants using 21st-century teaching skills had higher confirmative skills, and as a result, they had endorsement for positive behaviors and respect for individual differences. On the other hand, they had lower levels of flexible teaching skills, and thus they were less likely to apply extracurricular social and educational activities.

No significant difference was found between 21st-century teacher skills use and the gender of the participants in the present study. There are conflicting findings as to the effect of gender in the literature. Although a considerable number of studies found that 21st century teachers' skills do not differ by gender (Gürültü, Aslan &; Alcı, 2019; Eğmir &; Çengelci, 2020; Korkmaz, 2019; Kozikoğlu &Özcanlı, 2020; Peker, 2019; Yalçın-İncik, 2020), some studies reported significant differences.For example, Orhan-Göksün (2016) stated that the female teachers in her study used 21st-century teacher skills more significantly than male teachers. In contrast, Çınar (2019) reported a significant difference in favor of men.The fact that there was no difference in the use of 21st-century teacher skills in terms of gender may be due to the principle of equal opportunity in education, which prevents gender discrimination in the Turkish education system. In this respect, it can be expected that the 21st-century teacher skills of individuals who are trained and become teachers on the principle of equal opportunity in education are at the same level.

There was no significant difference between 21st-century teacher skills use of the participants concerning their work experience. In other words, it can be said that the participants' 21st-century teacher skills use were at the same level in terms of work experience. This finding is supported by several studies in the literature. For example, Gürültü, Etc. (2018) found that classroom teachers' use of 21st-century teacher skills did not differ in work experience. Similarly, Yalçın-İncik (2020) reported that work experience did not affect 21st-century teacher skills use of high school teachers. However, there are also studies in the literature stating that the use of 21st-century teaching skills differs concerning work experience. For example, Eymir and Çengelci (2020) found that teachers with 6-10 years and 11-15 years of work experience had higher 21st-century skills than teachers with 1-5 years of work experience. Similarly, Korkmaz (2019) reported that teachers with 1-5 years and 11-15 years of work experience had higher 21st-century skills than teachers with 6-10 years and 16 years more of work experience. Finally, Kozikoğlu and Özcanlı (2020) stated that teachers with 1-5 years of work experience were higher21st-century skills than teachers with 16 years or more of work experience. These studies reveal that work experience influences the use 21st- century teacher skills of teachers. It can be said that the reason for this situation is the differences of the participants in these studies.

As a result of this study, it was found that the participants had a moderate level of critical thinking skills. In this context, Ağdacı (2018) reported that classroom teachers had higher critical thinking skills than teachers of other branches. Furthermore, studies in the literature have revealed that the critical thinking skill levels of teachers were at medium (Ağdacı, 2018; Akdemir, 2019; Arslan, 2016; Aslan, 2019; Hazer, 2011; Özden, 2019)) and high levels (Alkın-Şahin &; Gözütok, 2013; Facione, Giancarlo & Facione, 1995). In this sense, the present study's findings are in consistentwith those in the literature.According to Polat and Kontaş (2018), the training received by classroom teachers may be based on critical thinking skills, and their reading habits maypositively influence their critical thinking skills.

The present study revealed no significant difference between the critical thinking skills of classroom teachers in terms of gender. This finding is supported by several studies in which no relationship was found as well (Akdemir, 2019; Alkoç, 2020; Alkın-Şahin & Gözütok, 2013; Aslan, 2019; Caldwell, 2012; Friedel, Irani, Rudd, Gallo & Eckhardt, 2006; Zincirli, 2014). On the other hand, Hazer (2011), Holley and Boyle (2012) and Yıldırım (2005) found that that female teacher had significantly higher critical thinking skill levels than male teachers. In sum, the studies inconsistent with present study result revealed that female participants have higher critical thinking skills.Doğanay, Akbulut-Taş and Erden (2007) stated in their study that it is challenging to generalize in a case in which critical thinking significantlydifferedby gender or not.

It was also found that work experience influenced the critical thinking skills of classroom teachers in this study. A difference was observed between the participants with 6-10 years of work experience and those with 11-15 years and 16-20 years of experience, identical mean scores. In this sense, it was found that participants with 6-10 years of work experience have higher critical thinking skills than those with 11-20 years of work experience. There are conflicting results concerning the effect of work experience in the literature. For example, Aslan (2019), Caldwell (2012), Özden (2019) and Yıldırım (2005) did not find a significant difference between work experience and critical thinking skills of teachers. However, Arslan (2016), Akdemir (2019) and Moore (2010) reported a significant difference between teachers' work experience and critical thinking skills. Arslan (2016) and Akdemir (2019) concluded that as the work experience of teachers increase, their critical thinking skills are likely to increase as well. Studies in which a significant difference was reported between critical thinking and work experience do not completely support the result of the present study since critical thinking skills differed by different levels of work experience in these studies.In Turkey, with the change in the education system in 2005, the behaviorist approach was replaced by the constructivist approach. The role of critical thinking differs between the behaviorist approach and the constructivist approach. This could be the reason why there are differences in critical thinking skills between teachers trained in the behaviorist approach in the past and those trained in the constructivist approach today.

It was reported in the present study that a statistically significant positive correlation existed between 21st-century teacher skills use and critical thinking skills. This relationship was at a medium level. In this context, it can be argued that a classroom teacher possessing critical thinking skills also uses 21st-century teacher skills. In other words, classroom teachers, whose use of 21st-century teacher skills increases, tend to develop critical thinking skills. In this regard, in her study with prospective teachers, Alkoç (2020) found a statistically significant positive relationship between 21st-century learner skills use and critical thinking tendency.

Furthermore, the studies conducted with pre-service teachers (Orhan-Göksün, 2016) and classroom teachers (Kıyasoğlu, 2019) reported a moderate and significant positive relationship between the 21st-century learner skills use and of 21st-century teacher skills use. The studies in the literature supports the findings of the present study. In the light of these two studies, if there is a positive relationship between 21st-century learner skills and 21st-century teaching skills, and between 21st-century learner skills and critical thinking skills, a positive relationship can be expected between 21st-century teaching skills and critical thinking skills. At the same time, 21st-century skills, which cover 21st-century learner skills and 21st-century teacher skills, include critical thinking within the scope of learning and renewal sub-dimension (Parnership for 21st Century, 2015). The present study may suggest a positive relationship between critical thinking and 21st-century teacher skills.The results of the present studt supported this idea.

Finally, examining the relationship between classroom teachers' 21st-century teacher skills use and critical thinking skills in terms sub-scales indicated significant positive relationships between the sub-scales. The strongest relationship between the 21st-century teacher skills use, and the sub-scales of critical thinking skills was found between Administrative Skills and Decision-making. On the other hand, the weakest relationship was found between Confirmatory Skills and Assessment sub-scales and Flexible Teaching Skills and Assessment subscales.It can be concluded that this relationship may indirectly affect some of the situations that consist of the 21st-century teacher skills.

5. Recommendations

- It is concluded that critical thinking has a positive effect on 21st-century teacher skills. Thus, critical thinking courses and instruction should be offered to prospective teachers.
- It was found that flexible teaching skills, a sub-scale of 21st-century teaching skills, was lower than other skills. Therefore, classroom teachers should be presented with courses or in-service training on using extracurricular and social activities.
- There is significant difference in the levels of confirmative skills, a sub-scale of the 21st-century teacher skills. Therefore, a qualitative study may be conducted to investigate confirmative skills in detail.

- Similar studies can be conducted with teachers at different levels of education or in otherregions to investigate the relationship between 21st-century teacher skills use and critical thinking skills.

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