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Investigation of Self-Efficacy Perceptions Regarding the 21st Century Skills of University Students Enrolled in Different Faculties

Aylin Mentiş Köksoy¹, İskender Daşdemir²

¹ Ege University, İzmir, Turkey. ORCID: 0000-0003-4549-0579

² Ege University, İzmir, Turkey. ORCID: 0000-0003-4158-2388

Correspondence: Aylin Mentiş Köksoy, Ege University, İzmir, Turkey. E-mail: aylinmentiskoksoy@gmail.com

Abstract

The 21st-century skills are considered to be needed by individuals in a changing world. The aim of this research study is to determine whether or not the self-efficacy perceptions of students enrolled in the Faculty of Education, the Faculty of Literature, and the Faculty of Nursing (health) pertaining to the 21st-century skills cause any difference among the faculties. The population of the research is comprise of 1,056 students, 841 females and 215 males, at Ege University during the fall semester of the 2018-2019 academic year. “21st Century Skills Self-efficacy Perception” scale, which has 3 subdimensions such as “Learning and Renewal (LR) Skills,” “Life and Career (LC) Skills,” and “Information, Media and Technology (IMT) Skills,” is utilized in the study. The research study is designed in accordance with the causal-comparative model. In the data analysis, independent groups t-test is performed to detect differences in terms of gender, whereas the one-way analysis of variance) techniques are conducted to detect differences in terms of faculties. The margin of error is determined as .05 in the study. No significant difference is detected in the LR skills of university students in terms of the gender variable. It is found that a significant difference exists according to gender in the subdimension of LC skills. No significant difference is observed according to gender variable in the subdimension of IMT skills of university students. According to this result, the LC skills of female students are detected to be higher than that of male students. It is observed that the LR skills of the students in the faculty of education are higher than that of the students in the faculty of health sciences. It is determined that a significant difference exists in the LC skills of university students according to the faculty of education variable. It is determined that the LC skills of the students in both the faculties of education and literature are higher than that of the students in the faculty of health sciences. Furthermore, it is determined that the IMT skills of the students in the faculty of education and the faculty of literature are higher than that of the students in the faculty of health sciences.

Keywords: 21st-Century Skills, Faculty of Education, Faculty of Literature, Faculty of Nursing (Health)

1. Introduction

The contemporary, highly competitive, and knowledge-based global societal economy, as well as developments in information and communication Technologies (ICT), bring forth the requirement of individuals, especially for

education systems, to adapt to this change as soon as possible. It would be ensured that students who need to be prepared for the professions of the future are not lagged behind and that they do not encounter a disadvantageous situation by being equipped with the 21st-century skills, also known as “survival skills,” which are necessary for the education and professional life of the students. In a rapidly changing world, schools usually cannot keep up with such change and cannot adjust to the development at the same pace (Wagner, 2008; cited in Cemaloğlu et al., 2019). The contemporary age involves the era of the knowledge-based economy, and economic competition among countries depends on individuals who acquire skills that meet the requirements of the current age. This circumstance reveals the reality within which individuals’ cooperation changes competition and effective communication with others depends on technology, and it has created the need for individuals to acquire non-conventional problem-solving skills (Varis, 2007). Education looms large in acquiring the skills required by the ongoing era, in increasing the welfare level of the society, in the social and economic development of the society, and in raising individuals who form the dynamics of the society. The skills required by the era, which should be acquired through education, are generally expressed as the 21st-century skills (Uyar and Çiçek, 2020). Consisting of high-level thinking skills, as well as productivity, innovation, creativity, cooperation and communication skills, lifelong learning, ICT literacy, personal and social responsibility, those skills are included in the literature (Bozkurt and Çakır, 2016). Upon examining the classifications of the 21st-century skills, it is seen that certain common and different aspects become prominent. Cooperation, communication, IMT skills, social and cultural skills, and citizenship are perceived as common skills in all classifications. Creativity, critical thinking, problem-solving, and creating qualified products are among the skills that have been most frequently used in classifications (Voogt and Roblin, 2012).

The term “21st century skills” refers to core efficacies, including communication, collaboration, creativity, critical thinking, digital literacy skills, as well as the LC skills that support the idea that schools, administrators, and teachers should integrate these skills into their teaching contexts and curricula. The 21st-century skills are the ones that stem from synthesized skills and information. Briefly, the inclusive and up-to-date skills needed in the ongoing century define them (Griffin et al., 2018). At the same time, one of the most essential objectives of education in the 21st century is to provide students with information that would facilitate their daily lives and to facilitate their participation in the business world in the light of such information (Trilling and Fadel, 2009). As a result of economic, social, political, and especially technological changes throughout the last century, and contingent upon these developments, certain changes are observed in the qualifications of the required individuals. Therefore, these developments in different aspects influence the education systems that would enable the presence of qualified individuals and may render it compulsory for countries to determine some changes in their education policies (Özdemir, 2011). Within the advancing information society, the skills that students wish to acquire to render them qualified employees and good individuals are expressed as the 21st century skills (Ananiadou and Claro, 2009). In this context, various educational foundations have tried to generate frameworks to describe the 21st century skills and suggest the extent to which they are integrated, in general, into the education system (Brown et al., 2008). The global validity of the ongoing 21st century involves “skills.” In societies that are unable to achieve the necessary investment in these skills, people would be pushed to the fringes of the society, even if technological developments exist, these will not transform into economic growth, and societies in such situations would fall far behind the information-based global societies and fail in the global race. It is crucial to invest in the acquisition of “skills,” which is the most essential solution, throughout the life of individuals, that is, beginning from early childhood, throughout their mandatory education and professional life (OECD, 2012). While emphasizing active citizenship, creativity, problem-solving, critical thinking, and collaboration rather than good citizenship; the 21st century skills attach importance to literacy and the use of technological instruments such as information, media, or the digital age. It also includes respect for different cultures, coexistence, access to and use of information. In order for individuals to lead more qualified and productive lives, it is necessary to provide these skills to be acquired through education, and therefore, to include skills in education programs (Anagün et al., 2016).

Hixson et al. (2012) stated that each student in the 21st century must have had the following 8 skills: communication skills, Critical thinking, innovation, creativity, self-direction, collaboration, local and global connections skills, and technology as a learning instrument. In this study, the 21st century skills are categorized into 3 subdimensions such as “Learning and Renewal (LR) Skills,” “Life and Career (LC) Skills” and “Information, Media and Technology (IMT) Skills.”

Upon examining the literature regarding the subject, it is observed that various studies have been carried out on the 21st century skills. Studies, which dealt with the conceptual framework of those skills within the context of teachers' self-efficacy (Wilborn, 2013; Eryılmaz and Uluyol, 2015), emphasized that individuals should have had the 21st century skills besides their basic knowledge and skills in order to become successful both in their educational and daily lives. Başar (2018) examined preservice science teachers' beliefs on the 21st century skills as well as their self-efficacy views regarding the place of mathematics in science in his master's thesis. Several studies (Dede, 2009; Larson and Miller, 2011; Voogt and Roblin, 2012; Chalkiadaki, 2018) have been conducted to define the conceptual framework of the 21st century skills including classifications made in terms of different institutions. Anagün et al. (2016) conducted a study on the design of a reliable measurement instrument called "the 21st Century Skills Competence Scale" to determine the extent to which teaching candidates acquire the 21st century skills. On the other hand, there are studies (Latham et al., 2013; Aslan, 2015; Valtonen et al., 2016; Günc et al., 2013) conducted on the measurement (Kyllonen, 2012; Yalçın, 2018) and development (Kotluk, 2015; Short, 2012) of the 21st century skills, which usually evaluates them in terms of various dimensions according to the opinions of teaching candidates. Cansoy (2018) dealt with the investigation of the 21st century skills. Bozkurt and Çakır (2016), in their research study, handled the secondary school students' learning skills. Özdemir-Özden et al. (2018) discussed the efficacy perceptions of teaching candidates regarding the 21st century skills in this study. Dinler et al. (2021) dealt with the 21st century skills of 3-6-year-old children in terms of several variables. Cemaloglu et al. (2019) investigated the 21st century skills self-efficacy perceptions of vocational high school teachers. Göktepe-Yıldız (2020) analyzed the high school students' 21st century skills according to several demographic indicators. Uyar and Çiçek (2020) explicated the 21st century skills of teachers from different branches. Yalçın (2018), however, defined the 21st century skills and introduced several approaches and tools to measure those skills in his study. Moreover, although not described under the title of the 21st century skills, there are also various individual studies conducted on the 21st century sub-skills. Therefore, this research study is carried out as a pioneer in determining the self-efficacy perceptions of students in the Faculty of Education, Faculty of Literature, and Faculty of Nursing (Health) at Ege University, and to determine whether or not any difference exists among faculties. It is important in terms of providing data for other studies to be conducted.

In this context, the aims of the research study are determined as follows:

- Do the self-efficacy perceptions of the students in the Faculties of Education, Literature, and Nursing (Health) regarding the 21st century skills significantly differ by gender in the subdimension of "LR Skills"?
- Do the self-efficacy perceptions of the students in the Faculties of Education, Literature, and Nursing (Health) regarding the 21st century skills significantly differ by gender in the subdimension of "LC Skills"?
- Do the self-efficacy perceptions of the students in the Faculties of Education, Literature, and Nursing (Health) regarding the 21st century skills significantly differ by gender in the subdimension of "IMT Skills"?
- Do the self-efficacy perceptions of the students in the Faculties of Education, Literature, and Nursing (Health) regarding the 21st century skills significantly differ according to the subdimensions of "LR Skills," "LC Skills," and "IMT Skills"?

2. Method

In this part, information regarding the research model, population and sample, data collection tools utilized by the research study, and data analyses are included.

2.1 Research Model

This study, which examines the self-efficacy perceptions regarding the 21st century skills in terms of the gender and faculty variables of university students in the Faculties of Education, Literature, and Nursing (Health), is designed in a causal-comparative model. Causal comparative studies are conducted to determine the causes of an existing/naturally occurring situation or event, and the variables that affect those causes or the outcomes of an impact (Büyüköztürk et al., 2008: 185). Causal comparative research studies are similar to experimental research studies in terms of explaining the cause-effect relationship. Nevertheless, unlike experimental studies, the

investigated situation arises independently of the manipulation of the researcher in causal-comparative studies. The researcher, on the other hand, makes effort to detect the probable causes and impacts of this circumstance (Büyükoztürk et al., 2008; Cohen and Manion, 1994). In other words, no external intervention exists for generating a designed environment to determine cause-effect relationships, and to manipulate variables, as in experimental research studies (Emrahoğlu and Öztürk, 2010).

2.2 Research Population and Sample

The population of the research study consists of 1,056 students (841 females and 215 males) at Ege University during the fall semester of the academic year of 2018-2019. It is aimed at reaching the entire population, but due to the restriction of working with voluntary participants pursuant to research ethics, it is necessary to generate a sample.

The voluntary response sampling method, one of the non-probability sampling methods, is employed to determine the research sample. The voluntary response sampling method is determined later, and after reaching the entire population, the voluntary participants constitute the sample. The research is conducted with the participation of 1,056 out of 1,100 university students in the Faculties of Education, Literature, and Nursing (Health) at Ege University who have returned the completed scale forms.

2.3 Data Collection Tool

The data collection tool prepared to collect the views of university students in the Faculties of Education, Literature, and Nursing (Health) to investigate their self-efficacy perceptions regarding the 21st century skills was designed by Anagün et al. (2016). The scale, which is comprised of 42 items, has three-dimensions. The first dimension of the scale, namely, "LR skills" consists of 18 items; the second dimension of the scale, called "LC skills," consists of 16 items; whereas the third dimension of the scale, "IMT skills," consists of 8 items. The 21st century skills self-efficacy perception scale is a five-point Likert-type scale. The items in the scale are graded as "1-Never, 2-Rarely, 3-Sometimes, 4- Often, 5-Always."

2.4. Data Analysis

In this study, which aims to detect the differences in the 21st century skills of university students, differences in terms of gender are investigated performing independent groups t-test, whereas differences in terms of faculties are examined with the one-way analysis of variance techniques. The margin of error in the study is accepted as .05.

3. Findings

T-Test Results						
Variables	Gender	n	\bar{x}	sd	t	p
LR Skills	Female	841	68.37	10.08	-1.09	.28
	Male	215	69.20	9.55		
LC Skills	Female	841	66.41	6.75	-2.91	.00*
	Male	215	64.89	7.21		
IMT Skills	Female	841	34.49	4.50	.10	.92
	Male	215	34.46	4.22		

Note: *p<.05

No significant difference ($t(1054) = -1.09, p > .05$) is found in the LR skills of university students according to the gender variable. In other words, the levels of LR skills of men and women are quite similar.

It is determined that a significant difference ($t(1054)= 2.91, p < .05$) exists in the LC skills of university students according to the gender variable. Accordingly, the levels of LC skills of female students are higher than that of male students.

It is observed that no significant difference ($t(1054)= .10, p > .05$) exists in the IMT skills of university students according to the gender variable. According to this finding, it can be stated that the IMT skills of male and female students are similar to each other.

Table 1: Examination of the LR skills in terms of the faculty variable

Dimension	Faculty	n	M	Source of Variance	Sum of Squares	sd	Mean Square	F	Diff.
LR Skills	1. Education	316	69.99	Between Groups	1470.30	2	735.15	7.48*	1-3
	2. Literature	321	68.88	Within Groups	103549.95	1053	98.34		
	3. Health	419	67.19	Total	105020.25	1055			

Note: * $p < .05$

A significant difference ($F(2, 1053)= 7.48, p < .05$) exists in the LR skills of university students according to the faculty of education variable. In the Scheffe test, performed to determine the source of variance, it is detected that the levels of LR skills of the students in the faculty of education are higher than that of the ones in the faculty of health sciences.

Table 2: Examination of the LR skills in terms of the faculty variable

Dimension	Faculty	n	M	Source of Variance	Sum of Squares	sd	Mean Square	F	Diff.
LC Skills	1. Education	316	66.52	Between Groups	597.57	2	298.79	6.38*	1-3 2-3
	2. Literature	321	66.70	Within Groups	49325.69	1053	46.84		
	3. Health	419	65.20	Total	49923.26	1055			

Note: * $p < .05$

A significant difference ($F(2, 1053)= 6.38, p < .05$) exists in the LC skills of university students according to the faculty of education variable. In the Scheffe test, performed to determine the source of variance, it is detected that the levels of LC skills of the students in the faculties of both education and literature are higher than that of the ones in the faculty of health sciences.

Table 3: Examination of the IMT skills in terms of the faculty variable

Dimension	Faculty	n	M	Source of Variance	Sum of Squares	sd	Mean Square	F	Diff.
IMT skills	1. Education	316	35.25	Between Groups	552.96	2	276.48	14.33*	1-3 2-3
	2. Literature	321	34.88	Within Groups	20312.88	1053	19.29		
	3. Health	419	33.61	Total	20865.84	1055			

Note: * $p < .05$

It is observed that a significant difference ($F(2, 1053)= 14.33, p < .05$) exists in the IMT skills of university students according to the faculty of education variable. In the Scheffe test, performed to determine the source of variance, it is detected that the levels of IMT skills of the students in the faculties of both education and literature are higher than that of the ones in the faculty of health sciences.

4. Conclusion, Discussion, and Suggestions

In this research study, the students in the Faculties of Education, Literature, and Nursing (Health) are assessed by gender and it is aimed to investigate whether or not any difference exists among the self-efficacy perceptions of faculties regarding the 21st century skills.

In the study, no significant difference is shown in the LR skills of university students according to the gender variable. In other words, the LR skills subdimensions of women and men are similar to each other.

In terms of gender variables, a significant difference exists in the subdimension of university students' LC skills. According to this result, the LC skills of female students are higher than that of male students. Gülen (2013) and Karakaş (2015) also concluded in their studies that the 21st century skills of female students were higher than that of male students. This finding complies with the results of our study.

In terms of the gender variable, no significant difference exists in the subdimension of IMT skills of university students. According to this finding, it may be asserted that the IMT skills of both genders are similar to each other. It is asserted that a significant difference exists in the LR skills of university students according to the faculty variable. In the Scheffe test, performed to determine the source of variance, it is determined that the levels of LR skills of the students in the faculty of education are higher than that of the ones in the faculty of health sciences. It is found that a significant difference exists in the LC skills of university students according to the faculty of education variable. In the Scheffe test, performed to determine the source of variance, it is detected that the levels of LC skills of the students in the faculties of both education and literature are higher than that of the ones in the faculty of health sciences.

A significant difference exists in the IMT skills of university students according to the faculty of education variable. In the Scheffe test, performed to determine the source of variance, it is detected that the levels of IMT skills of the students in the faculties of both education and literature are higher than that of the students in the faculty of health sciences. The reason for this involves the fact that the 21st century students, who are quite accustomed to interacting with contemporary technology and the digital world, are expected to acquire high levels of information and technology (IT) literacy skills, given the frequent technology usage features, it is considered a positive outcome as it is one of the most crucial skills required to fulfill the needs of the 21st century. It is also thought that the personal characteristics of the students have an impact on the differences in IT literacy among nursing students.

Upon examining the literature; it is determined that similar measurement tools are used in studies investigating self-efficacy regarding 21st century skills. Therefore, it can be claimed that the utilized measurement tool is appropriate for the structure of the study. Gülen (2013), in his study conducted on secondary school students, detected that they had a good level of active learning, problem-solving, learning to learn, cooperation, and communication skills, which are within the scope of the 21st century skills. Karadaş et al. (2021) examined the 21st century skills of nursing and midwifery students according to several variables. They concluded that the 21st century skills of both nursing and midwifery students were above the average, and there were skill domains that needed to be improved. Similarly, Kozikoğlu and Altunova (2018), in their study conducted on the preservice teachers using the same scale, determined that the self-efficacy perceptions of the preservice teachers were at a high level, whereas did not differ by the subdimensions. Again, Özdemir- Özden et al. (2018), utilizing the same scale, indicated that preservice teachers had a high level of competence perceptions, nonetheless, there were differences in some subdimensions. Karakaş (2015), in his study conducted on the 8th-grade students, asserted that students had high levels of affective, cognitive and sociocultural dimensions of the 21st century skills.

This might be due to the parallelism between the skills included in the 21st century skills and the skills included in the curriculum. In order for individuals to keep up with the current age and have their shares in employment, it is imperative that they have a set of skills that are defined as the 21st century skills. This study is crucial in terms of revealing the self-efficacy perception levels of students in different faculties regarding the 21st century skills and investigating the impacts of various variables. Within the scope of the study, the impacts of the entire variables

discussed are revealed. No significant differences may be found in terms of some variables, however, the finding that involves lack of differentiation has also data quality, and is thought to contribute to researchers who would study in the field. Besides, the obtained results within the scope of this study are thought to provide an idea on such issues as the self-awareness of future teacher candidates, the extent to which they are ready for the era and the profession, and the effectiveness of the ongoing teacher training systems in raising the 21st century teachers. The same is true for students in the Faculty of Literature. It can be claimed that the reason why the students of the Faculty of Nursing (Health) have lower levels of IMT skills, as well as the LC skills, compared to the students in other faculties stems from the fact that they have weaker such skills since they work quite intensely in terms of profession. Therefore, it is thought that rendering the working hours of health workers a little more flexible and providing them with more social opportunities would mitigate the insufficiencies of health students in this regard.

References

- Anagün, Ş. S., Atalay, N., Kılıç, Z. & Yaşar, S. (2016). Öğretmen adaylarına yönelik 21. yy. becerileri yeterlilik algıları ölçeğinin geliştirilmesi: Geçerlik ve güvenilirlik çalışması. *PAU Eğitim Fakültesi Dergisi*, 40, 160-175. <https://doi.org/10.9779/puje768>
- Ananiadou, K. ve Claro, M. (2009). 21st century skills and competences for new millennium learners in OECD countries. OECD Education Working Papers, No. 41, OECD Publishing. <https://doi.org/10.1787/218525261154>.
- Aslan, S. (2015). Is learning by teaching effective in gaining 21st century skills? The views of pre-service science teachers. *Educational Sciences: Theory & Practice*, 15(6), 1441-1457.
- Başar, S. (2018). *Fen bilimleri öğretmen adaylarının fende matematiğin kullanımına yönelik özyeterlik inançları, 21.yy becerileri ve aralarındaki ilişkinin incelenmesi*. Yayımlanmamış yüksek lisans tezi, Hacettepe Üniversitesi Eğitim Bilimleri Enstitüsü.
- Bozkurt, Ş. B. ve Çakır, H. (2016). Ortaokul öğrencilerinin 21. yüzyıl öğrenme beceri düzeylerinin cinsiyet ve sınıf seviyesine göre incelenmesi. *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi*, 39(39), 69-82
- Brown, P., Lauder, H. ve Ashton, D. (2008). Education, globalization and the knowledge society. London: The teaching and learning research programme.
- Büyüköztürk, Ş., Çakmak, E., Akgün, Ö., Karadeniz, Ş., Demirel, F. (2008). *Bilimsel Araştırma Yöntemleri*. (1. Baskı). Ankara: Pegem Akademi.
- Cansoy, R. (2018). Uluslararası çerçevelere göre 21. yüzyıl becerileri ve eğitim sisteminde kazandırılması. *İnsan ve Toplum Bilimleri Araştırmaları Dergisi*, 7(4), 3112-3134.
- Cemaloğlu, N., Arslanlangıç, A. S., Üstündağ, M. T. ve Bilasa, P. (2019). Meslek lisesi öğretmenlerinin 21. yüzyıl becerileri özyeterlik algıları. *Kırşehir Eğitim Fakültesi Dergisi*, 20(2), 845-874.
- Chalkiadaki, A. (2018). A systematic literature review of 21st century skills and competencies in primary education. *International Journal of Instruction*, 11(3), 1-16.
- Cohen, L., Manion, L. (1994). *Research Methods In Education* (Fourth Edition), Routledge.
- Dede, C. (2009). Comparing frameworks for "21st century skills". [http://stechnology.pbworks.com/f/Dede_\(2010\)_Comparing%20Frameworks%20for%2021st%20Century%20Skills.pdf](http://stechnology.pbworks.com/f/Dede_(2010)_Comparing%20Frameworks%20for%2021st%20Century%20Skills.pdf) adresinden 14.09.2021 tarihinde alınmıştır.
- Dinler, Simsar ve Yalçın. (2021). 3-6 Yaş çocukların 21. yüzyıl becerilerinin bazı değişkenler açısından incelenmesi. *e-Kafkas Eğitim Araştırmaları Dergisi*, 8, 281-303. doi: 10.30900/kafkasegt.941467.
- Emrahoğlu, N., & Öztürk, A. (2010). Fen bilgisi öğretmen adaylarının akademik başarılarına bilişsel farkındalığın etkisi: bir nedensel karşılaştırma araştırması. *Çukurova Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 19(2), 18-30. <https://doi.org/10.31592/aeusbed.689518>
- Eryılmaz, S., & Uluyol, Ç. (2015). 21. yüzyıl becerileri ışığında Fatih projesi değerlendirmesi. *Gazi Eğitim Fakültesi Dergisi*, 35(2), 209-229.
- Göktepe-Yıldız, S. (2020). Lise öğrencilerinin 21. yüzyıl becerilerinin bazı demografik değişkenler açısından incelenmesi. *Ulakbilge Sosyal Bilimler Dergisi*, 8(51), 884-897. <https://doi.org/10.33905/bseusbed.523196>
- Griffin, P., Care, E., & McGaw, B. (2012). The changing role of education and schools. In *Assessment and teaching of 21st century skills* (pp. 1-15). Springer, Dordrecht. https://doi.org/10.1007/978-94-007-2324-5_1
- Griffin, P., Care, E., ve McGaw, B. (2018). The changing role of education and schools. Care, Esther, Griffin, Patrick, Wilson, Mark (Ed.), *Assessment and teaching of 21st century skills* (1. Baskı içinde (s. 1-15). Dordrecht: Springer.
- Gülen, Ş. B. (2013). *Ortaokul öğrencilerinin 21. yüzyıl öğrenme becerileri ve bilişim teknolojileri ile destekleme düzeylerinin cinsiyet ve sınıf seviyesine göre incelenmesi* (Yüksek Lisans Tezi). Erişim Adresi: <https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp>.

- Günüç, S., Odabaşı, H. F., & Kuzu, A. (2013). 21. Yüzyıl öğrenci özelliklerinin öğretmen adayları tarafından anımlanması: Bir twitter uygulaması. *Eğitimde Kuram ve Uygulama*, 9(4), 436-455.
- Hixson, N. K., Ravitz, J. ve Whisman, A. (2012). Extended Professional Development in Project-Based Learning: Impacts on 21st Century Skills Teaching and Student Achievement. West Virginia Department of Education. <https://files.eric.ed.gov/fulltext/ED565466.pdf> adresinden 10.09.2021 tarihinde alınmıştır.
- Karadaş, A. , Kaynak, S. , Ergün, S. & Palas Karaca, P. (2021). Hemşirelik ve Ebelik Öğrencilerinin 21. Yüzyıl Becerilerinin Bazı Değişkenlere Göre İncelenmesi . *Ordu Üniversitesi Hemşirelik Çalışmaları Dergisi* , 4 (2) , 232-239 . DOI: 10.38108/ouhcd.906190.
- Karakaş, M, M. (2015). *Ortaokul sekizinci sınıf öğrencilerinin fen bilimlerine yönelik 21. yüzyıl beceri düzeylerinin ölçülmesi* (Yüksek Lisans Tezi). Erişim adresi: <https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp>.
- Kotluk, N., & Kocakaya, S. (2015). 21. yüzyıl becerilerinin gelişiminde dijital öykülemeler: Ortaöğretim öğrencilerinin görüşlerinin incelenmesi. *Eğitim ve Öğretim Araştırmaları Dergisi*, 4(2), 354-363.
- Kozikoğlu, İ. & Altunova, N. (2018). Öğretmen adaylarının 21. yüzyıl becerilerine ilişkin öz-yeterlik algılarının yaşam boyu öğrenme eğilimlerini yordama gücü. *Yükseköğretim ve Bilim Dergisi/Journal of Higher Education and Science*, 8(3), 522-531. Doi: <https://doi.org/10.5961/jhes.2018.293>.
- Kyllonen, P. C. (2012, May 7-8). Measurement of 21st century skills within the common core state standards. K-12 Center at ETS. Invitational Research Symposium on Technology Enhanced Assessments, Washington D.C. <http://www.ets.org/Media/Research/pdf/session5-kyllonenpaper-tea2012.pdf> adresinden 14.09.2021 tarihinde alınmıştır.
- Larson, L. C., & Miller, T. N. (2011). 21st century skills: Prepare students for the future. *Kappa Delta Pi Record*, 47(3), 121-123. <https://doi.org/10.1080/00228958.2011.10516575>
- Latham, D., Gross, M., & Witte, S. (2013). Preparing teachers and librarians to collaborate to teach 21st century skills: Views of LIS and education faculty. *American Association of School Librarians*, 16, 1-23. <https://doi.org/10.3233/efi-150957>
- OECD (2012), Better skills, better jobs, better lives: A strategic approach to skills policies, OECD Publishing. <https://doi.org/10.1787/9789264177338-en> adresinden 10.09.2021 tarihinde alınmıştır.
- Özdemir, S. M. (2011). Toplumsal değişme ve küreselleşme bağlamında eğitim ve eğitim programları: kavramsal bir çözümleme. *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi*, 12(1), 85- 110.
- Özdemir-Özden, D., Karakuş-Tayşi, E., Kılıç-Şahin, H., Demir-Kaya, S., & Bayram, F. Ö. (2018). Öğretmen adaylarının 21. yüzyıl becerilerine yönelik yeterlik algıları: Kütahya örneği. *Electronic Turkish Studies*, 13(27), 1163-1184. Doi: 10.7827/TurkishStudies.14928
- Short, B.J. (2012). 21 St century skills development: Learning in digital communities: Technology and collaboration (Unpublished doctoral dissertation). Department of Educational Methodology, Policy, and Leadership. Graduate School of the University of Oregon, USA.
- Trilling, B. ve Fadel, C. (2009). 21st century skills: Learning for life in our times. Francisco: Jossey-Bass.
- Uyar, A., Çiçek, B. (2021). Farklı branşlardaki öğretmenlerin 21. yüzyıl becerileri. *IBAD Sosyal Bilimler Dergisi*, 9, 1-11.
- Valtonen, T., Sointu E.T., Kukkonen, J., Häkkinen, P., Järvelä, S., Ahonen, A. ve diğ. (2017). Insights into finnish first-year pre-service teachers' twenty-first century skills. *Education and Information Technologies*, 22(5), 2055-2069.
- Varis, T. (2007). New technologies and innovation in higher education and regional development. *Revista de Universidad y Sociedad del Conocimiento*, 4(11), 16-24.
- Voogt, J., & Roblin, N. P. (2012). A comparative analysis of international frameworks for 21st century competences: Implications for national curriculum policies. *Journal of Curriculum Studies*, 44(3), 299-321.
- Wagner, T. (2008). *Why even our best schools don't teach the new survival skills our children need and what we can do about it*. New York: Basic Books.
- Wilborn, J.W. (2013). *Teacher self-efficacy: common core state standards within a 21st century skills framework*. (Unpublished doctoral dissertation). Liberty University, Lynchburg, VA.
- Yalçın, S. (2018). 21. yüzyıl becerileri ve bu becerilerin ölçülmesinde kullanılan araçlar ve yaklaşımlar. *Journal of Faculty of Educational Sciences*, 51(1), 183-201.