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Demographic Characteristics and 21st Century Skills of High School Students: The Example of Konya*

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ABSTRACT

The 21st-century skills (21CSs) such as Digital Age Literacy (DAL), Inventive Thinking (IT), High Productivity (HP), Effective Communication (EC), and Spiritual Values (SV) encompass various abilities that are essential for adapting to the demands of the modern era and ensuring future success. This research was conducted to determine the developmental levels of high school students' 21CSs and to understand the impact of some demographic characteristics on these skills. Data related to the developmental levels of high school students' 21CSs and some demographic characteristics (gender, financial status of the family, educational status of the mother, educational status of the father and type of high school graduated) were collected using the 21st-Century Skills Scale (21CSS) adapted into Turkish by Erkılıç (2020). The scale was converted into an online survey shape and administered to 200 high school students studying in some of General, Anatolian, Science, and Vocational High Schools in the Konya province during the 2021-2022 academic year. The statistical analysis of the obtained data was conducted using the SPSS 23.00 software. Descriptive statistical analyses were used for the demographic data, while parametric tests were employed to analyze the relationships between variables. According to the results of the statistical analysis, it was determined that most of the demographic characteristics of high school students did not have a significant impact on the 21CSs of the high school students. On the other hand, it has been determined that there is a statistically significant difference in the development levels of students' Digital Age Literacy and High Productivity skills based on the mother's educational status.

Lise Öğrencilerinin Demografik Özellikleri ve 21.Yüzyıl Becerileri: Konya Örneği

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ÖZ

Dijital Çağ Okuryazarlığı (DÇO), Yaratıcı Düşünme (YD), Yüksek Verimlilik (YV), Etkili İletişim (Eİ) ve Manevi Değerler (MD) gibi 21. yüzyıl becerileri, çağın gerekliliklerine uyum sağlamak ve gelecekteki başarıları için önemli olan çeşitli yetenekleri içerir. Bu araştırma, lise öğrencilerinin 21. yüzyıl becerilerinin gelişim düzeylerini belirlemek ve öğrencilerin bazı demografik özelliklerinin bu beceriler üzerindeki etkisini anlamak amacıyla yapılmıştır. Lise öğrencilerinin 21.yüzyıl becerilerinin gelişim düzeyleri ve bazı demografik özellikleri (cinsiyet, ailelerin maddi durumu, anne eğitim durumu, baba eğitim durumu ve mezun olunan lise türü) ile ilgili veriler, Erkılıç (2020) tarafından Türkçeye uyarlanan 21.yüzyıl Becerileri Ölçeği (21YBÖ) ile toplanmıştır. Ölçek online anket formuna dönüştürülerek 2021-2022 eğitim öğretim yılında Konya ilindeki bazı Genel, Anadolu, Fen ve Meslek Liselerinde öğrenim gören 200 lise öğrencisine uygulanmıştır. Araştırmada elde edilen verilerin istatistiksel analizleri SPSS 23.00 programıyla gerçekleştirilmiştir. Araştırmada demografik veriler için betimleyici istatistiksel analizler, değişkenler arası ilişkileri analiz etmek için ise parametrik testler kullanılmıştır. Yapılan istatistiksel analiz sonuçlarına göre lise öğrencilerinin demografik özelliklerinin çoğunluğunun lise öğrencilerinin 21.yüzyıl becerileri üzerinde anlamlı bir etkiye sahip olmadığı tespit edilmiştir. Öte yandan öğrencilerin 21.yüzyıl becerilerinden sadece Dijital Çağ Okuryazarlığı ve Yüksek Verimlilik becerilerinin gelişim düzeylerinin annenin eğitim durumuna göre istatistiksel olarak anlamlı farklılık oluşturduğu saptanmıştır.

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INTRODUCTION

In the 21st-century, it has become a necessity for individuals to have the skills called 21st-Century Skills (21CSs) to be successful and happy individuals in their daily lives (Murat, 2018). In today's rapidly evolving world, the acquisition and development of 21CSs have become increasingly important for students. For this reason, the 21st-century information age requires not only learners, but also parents and teachers, who play an important role in the education of students, to have 21st-century skills in line with the needs of the 21st-century. Since the beginning of the 21st-century, various institutions and organizations around the world have carried out studies on what these 21st-century skills should be in individuals(Atalay & Anagun, 2016; Kan'An, 2018; Zorlu & Zorlu, 2021). Although a common classification of 21st-century skills has not been made yet, 21st-century skills have been tried to be defined with different classifications in studies conducted by many scientists, institutions, and organizations (Agaoglu & Demir, 2020; Barasi & Erdamar, 2021). Particularly, 21st-century skills revealed in studies carried out by some organizations (Partnership for 21st-Century Skills[P21], North Center Regional Educational Laboratory [NCREL] and METIRI Group) have pioneered scientists, institutions and organizations working on this subject. Within the scope of the project supported by NCREL and METIRI Group, 21st-century skills have been defined by Lemke (2002) as four dimensions: Effective Communication (EC), Inventive Thinking (IT), Digital Age Literacy (DAL), and High Productivity(HP). Similarly, in another project supported by organizations such as Cisco, Microsoft, and Intel, Binkley et al. (2012) defined ten skills as 21st-century skills in four sub-dimensions: Ways of Thinking, Work, Ways of Life and Work in the World. In another study by Malaysian scientists based on study carried out by Lemke (2002), 21st-century skills have been addressed in five sub-dimensions: Effective Communication (EC), Inventive Thinking (IT), High Productivity(HP), Digital Age Literacy (DAL), and Spiritual Values (SV)(Osman, Soh, & Arsad, 2010).

Since humans are emotional beings by nature, they must contain spiritual values in any era. As societies are made up of individuals devoid of these values, the 21st-century world created by them will be a world where robotic individuals deprived of human feelings live. For this reason, 21st-century skills were handled in this study as defined by Malaysian scientists Osman et al. (2010). There are many factors other than the innate intelligence of individuals that contribute to the realization of permanent learning in individuals. One such factor that has garnered attention in educational research is the impact of demographic characteristics on students' development levels of 21st-century skills. Demographic characteristics, including gender, socioeconomic status, parental education, and school type, have been identified as potential variables that may influence students' access to resources, opportunities, and educational experiences. Understanding the relationship between these demographic factors and students' skill development can provide valuable insights into the educational inequalities that may exist and guide the implementation of targeted interventions to address these disparities.

Some personality traits of people have an important effect on the correct and efficient use of intelligence. The formation of these personal characteristics begins in the family. As educators, it is crucial to understand the factors that may influence students' development of these skills to ensure effective instructional practices and support their overall academic achievement. In families, especially parents, other members of the family, children, and family elders' affect both the personality development and academic success of individuals because the first place where education starts for every individual is the family environment. Parents' education levels and their perspectives on life, religious beliefs, views on culture and art directly affect the development of their children's personalities. The schools where students study is also a demographic factor that affects the academic success of learners and can affect the development of students' personalities. For example, in Türkiye, while students are admitted to state-owned science high schools according to their High School Entrance Examination (LGS) scores, students are admitted to vocational high schools either without an exam or with very low LGS scores compared to science high schools. Considering this situation, the friend surrounding a student studying in any classroom in a science high school and the friend surrounding a student in a vocational high school are quite different from each other. The circle of students in science high schools consists of students who have goals related to their academic careers and study meticulously in all their other

courses, especially physics, in a highly disciplined way in line with these goals. However, the individuals with whom a student studying at any vocational high school study together are generally composed of students who are sent to school with the encouragement of their families to acquire a profession. Therefore, it can be said that the type of school in which the students' studies is an important factor for both their personality development and their academic success, especially in physics lessons.

Despite the passing of the first quarter of the 21st-century, individuals may be exposed to different evaluations from time to time, both in working environments and in educational environments, according to their gender. For this reason, the relationship between gender, academic success, and the 21CSs of students studying at different education levels has been investigated (Durak & Özüdoğru, 2023; Erkılıç, 2020; Göktepe Yıldız, 2020; Kan'An, 2018; Shah, Akhtar, & Malik, 2020). For example, in the study conducted by Shah et al. (2020) with 1149 8th, and 9th grade students, the average science success scores of female students were found significantly better than of the male students. Turiman, Osman, and Wook (2020) investigated the effectiveness of students' gender on their creative thinking levels using the 21CSs tool in their study with 240 students. Another demographic factor that is thought to have an impact on both individuals' achievement and their 21CSs is the economic status of the families of the students(Alkış, 2020; Çalışkan & Çoklar, 2019). It is expected that the fact that students have a tablet, mobile phone, laptop or desktop computer and internet facilities may have a direct effect on the development of their 21CSs such as DAL, IT and HP skills (Oral & Erkilic, 2022). Students who have these opportunities at home can gain a lot of new knowledge from social media and internet applications, create new perspectives, ideas, and solutions of problems, and get information quickly and efficiently (Alkış, 2020). Thus, some studies have shown that the economic structure of the family influences student achievement(Alkış, 2020; Eamon, 2005). On the other hand, the educational status of students' parents is considered as one of the factors that may have an impact on student success and the development of 21CSs. Shah et al. (2020) reported that the educational status of the parents of the students has a significant effect on the students' science achievement. In another study conducted by Ural and Çınar (2019), the level of education of the parents did not have a significant impact on the mathematics course achievement of the students. However, despite the many benefits of internet usage for people today, it is stated that the internet brings along many problems for young people (Arslankara & Ertuğrul, 2020; Erdem, 2022; Kavlak, Sarılır, & Tönbol, 2022). In this regard, the precautions that parents with a high level of education can take to ensure that their children do not encounter harmful internet content are of utmost importance. These results reveal that the effect of the educational status of the students' families on student achievement should be investigated further.

Investigation of demographic characteristics that may have an impact on 21CSs is also extremely important in terms of contributing to the solution of problems that prevent students' success in both physics and all other courses in the 21st-century information age and guiding new programs and educational activities. The objective of the current study was to examine how specific demographic characteristics impact the developmental levels of 21CSs among students. Specifically, the study will test the influence of gender, socioeconomic status, parental education, and school type on the acquisition and proficiency of critical thinking, problem-solving, communication, collaboration, and technological literacy skills among high school physics students. By exploring these factors, we aim to gain a deeper understanding of the potential variations in students' skill development and identify areas where additional support and interventions may be needed. The findings of this research will contribute to the existing literature on 21st-century skill development in the context of high school education. It will provide valuable insights for educators, policymakers, and researchers interested in promoting equitable access to and enhancement of 21CSs among high school students. By identifying the demographic characteristics that may impact students' skill development, educational stakeholders can develop targeted interventions and instructional strategies to support all students' acquisition of these crucial skills.

In conclusion, understanding the role of demographic characteristics in high school students' development levels of 21CSs is essential for creating inclusive and effective educational practices. By examining these factors, this study aims to shed light on the potential disparities that exist and guide

educational stakeholders in fostering a learning environment that promotes equitable skill development for all students. For this purpose, the problem of the research is expressed as: What is the relationship between some demographic characteristics of high school students and their level of 21CSs?

METHOD

Research Design

In this research, it was aimed to measure the relationship between the development levels of high school students' 21st-century skills and some demographic characteristics of the students. Thus, this research was conducted using the relational scanning model, one of the general scanning models of quantitative research methods. The relational scanning model is a scanning model that reveals the presence of change among two or more variables (Karasar, 2014). In the relational screening model, it is tried to determine whether the variables change at the same time, and if there is, how this change occurs. In relational screening models, although the results provide the researcher with insights in terms of causality, a very precise cause-effect relationship between the variables can never be revealed (Büyüköztürk, 2014).

Participants

The study's participants comprised 200 high school pupils across the 9th, 10th, 11th, and 12th grades based in selected high schools in central Konya. The investigation involved the random selection of both schools and classes participating in the research. Further comprehensive demographic information pertaining to the participants is presented in Tables 1-5.

Table 1. *Gender distributions of participants*

Gender	f	%
Female	120	60
Male	80	40
Total	200	100.0

According to Table 1 data; 60% of the participants were female students while 40% of them were male students.

Table 2. *Mother education level of the participants*

Education status	f	%
Primary school	82	41
Middle school	36	18
High school	38	19
Undergraduate	44	22
Total	200	100.0

In Table 2, information about the mother's education status of the participants is given. According to Table 2 data; 41% of the mothers of the participants consisted of primary school, 18% secondary school, 19% high school and 22% undergraduate education.

Table 3. *Father education level of the participants*

Education status	f	%
Primary school	50	25
Middle school	30	15
High school	43	21.5
Undergraduate	77	35.5
Total	200	100.0

In Table 3, information about the father's educational status of the participants is given. According to Table 3 data, it is seen that 25% of the participants' fathers are primary school graduates, 15% are middle school graduates, 21.5% are high school graduates and 35.5% are undergraduate graduates. According to the data of Table 3, most of the participants' fathers are undergraduate graduates.

Table 4. *Monthly income status of the participants' families*

Income status	f	%
1000 - 2000 TL	4	2
2001 - 3000 TL	35	17.5
3001 - 4000 TL	58	29
4001 and above	103	51.5
Total	200	100.0

Note: At the time of the survey, the minimum wage was around 2800 TL.

According to Table 4 data; it is seen that 2% of the participants' families had a monthly income between 1000-2000 TL, 17.5% had a monthly income between 2001-3000, 29% had a monthly income between 3001-4000 and 51.5% had a monthly income of 4001 and above. Thus, it can be stated that the income status of the families of most of the participants is above the minimum living wage at the time of the research.

Table 5. *The type of high schools of the participants*

High school type	f	%
General High School	46	23
Anatolian High School	62	31
Science High School	71	35.5
Vocational high School	21	10.5
Total	200	100.0

Information about the type of high school attended by the participants is given in Table 5. As seen in Table 5, 23% of the participants are graduates of General High School, 31% are graduates of Anatolian High School, 35.5% are graduates of Science High School, and 10.5% are graduates of Vocational High School. These findings indicate that Science High School students comprised most of the participating students in the research.

Research Instruments and Processes

In order to answer the research problems and sub-problems and to determine the participants' demographic data and the levels of development of 21st-century skills, the 21st-Century Skills Scale (21CSS) adapted into Turkish by Erkılıç (2020), was used as the data collecting instrument. This scale consisting of six main sections was included in an online survey form. The first section of the online survey form included questions to determine the participants' demographic characteristics, and the other five sections included 106 items and five sub-dimensions (DAL, IT, HP, EC, and SV) of 21CSs in the form of a 5-point Likert-type scale. The reliability analysis (Cronbach's Alpha [α]) and normality analysis (Skewness and Kurtosis) of the data obtained from the online survey answered by 200 people were performed. It was determined that the scale was normally distributed from the skewness (DAL:-.691, IT:-.220, EC: -.586, HP: -.688, SV: -.498) and kurtosis (DAL: 1.210, IT:.862, EC: 2.127, HP: 1.804, SV: .433) values between -3 and +3, and the reliability of the scale was found to be sufficient from the α values obtained over 0.70 (DAL:0.869, IT: 0.921, EC: 0.823, HP: 0.931, SV: 0.845) for each 21CSs (Karagöz, 2016).

Data Analysis

Statistical analysis of the online survey forms answered by the participants was performed using the SPSS 23.00 (Statistical Package for Social Sciences) program. Descriptive statistical analyses such as frequency (f), percentage (%), mean ($\bar{x}$), and standard deviation (SD) were used for the analysis of demographic data obtained from the research. Since the results of the performed normality analysis indicated a normal distribution for the five sub-dimensions of the 21CSS, parametric tests (Independent Samples t-test, Variance [ANOVA], and Tukey test) were used for the analysis of inter-variable relationships. For the reliability analyses of the sub-dimensions of the 21CSS used in the research, Correlation analysis (Cronbach's Alpha) was used.

Ethic

Ethics Committee: Necmettin Erbakan University Social and Humanity Scientific Research Ethics Committee.

Date of Ethics Committee Meeting: 16/04/2021

Meeting number: 04

Decision number: 2021/202

FINDINGS

The statistical analysis results obtained with independent samples t-test for the effect of gender variable on the 21CSs of the participants is given in Table 6.

Table 6. *Results of high school students' mean scores of 21CSs according to the gender variable.*

21CSs	Gender	N	$\bar{x}$	SD	t	Df	p
DAL	Female	120	3.51	.51	.326	198	0.745
	Male	80	3.48	.63			
IT	Female	120	3.58	.46	-.045	198	0.964
	Male	80	3.58	.59			
EC	Female	120	3.66	.51	.499	198	0.618
	Male	80	3.62	.72			
HP	Female	120	3.89	.62	1.444	198	0.150
	Male	80	3.75	.79			
SV	Female	120	3.77	.72	1.177	198	0.241
	Male	80	3.64	.92			

* DAL: Digital Age Literacy, IT: Inventive Thinking, EC: Effective Communication, HP: High Productivity, SV: Spiritual Values

According to the data in Table 6, the average scores of high school students' DAL, IT, EC, HP, and SV skills do not indicate a significant difference for the gender variable ($p>0.05$).

The results of the analysis of variance conducted for the students' development levels of 21CSs and the variable of mother's education level are given in Table 7.

Table 7. *Results of high school students' mean scores of 21CSs according to mother's education level.*

21CSs	Education level	N	$\bar{x}$	SD	F	p	Difference
DAL	Primary School	82	3.32	.56	5.426	**.001**	2>1
	Middle School	36	3.62	.51			4>1
	High School	38	3.56	.55			
	Bachelor's Degree	44	3.69	.52			
IT	Primary School	82	3.50	.52	1.286	.280	-
	Middle School	36	3.60	.51			
	High School	38	3.61	.54			
	Bachelor's Degree	44	3.68	.47			
EC	Primary School	82	3.59	.65	.533	.660	-
	Middle School	36	3.67	.57			
	High School	38	3.63	.61			
	Bachelor's Degree	44	3.73	.52			
HP	Primary School	82	3.70	.73	2.747	**.044**	4>1
	Middle School	36	3.77	.71			
	High School	38	3.96	.72			
	Bachelor's Degree	44	4.03	.53			
SV	Primary School	82	3.73	.81	.267	.849	-
	Middle School	36	3.63	.79			
	High School	38	3.80	.74			
	Bachelor's Degree	44	3.70	.87			

* DAL: Digital Age Literacy, IT: Inventive Thinking, EC: Effective Communication, HP: High Productivity, SV: Spiritual Values

According to the data in Table 7, there is a statistically significant difference in the mean scores of the DAL and HP subscales of the students' 21CSs in term of education levels of students' mothers. However, there is no significant difference in the mean scores of the IT, EC, and SV subscales. The Post-Hoc (Tukey) test performed to the mean scores of the DAL subscale reveals that the difference is due to the statistically significantly higher mean scores of students whose mothers have a middle school education (3.62) and students

whose mothers have a bachelor's degree (3.69) compared to students whose mothers have a primary school education (3.32). Similarly, the Post-Hoc (Tukey) analysis results regarding the differences in the mean scores of the HP subscale indicate that the statistically significant difference is due to the higher mean scores of students whose mothers have a bachelor's degree (4.03) compared to students whose mothers have a primary school education (3.70).

The results of the analysis of variance conducted for the development levels of 21CSs of high school students and the variable of father's education level are given in Table 8 below.

Table 8. *Results of high school students' mean scores of 21CSs according to father's education level.*

21CSs	Education level	N	$\bar{x}$	SD	F	p	Difference
DAL	Primary School	50	3.39	.50	2.190	.090	-
	Middle School	30	3.42	.47			
	High School	43	3.47	.60			
	Bachelor's Degree	77	3.62	.58			
IT	Primary School	50	3.59	.47	1.139	.335	-
	Middle School	30	3.53	.53			
	High School	43	3.47	.55			
	Bachelor's Degree	77	3.65	.51			
EC	Primary School	50	3.59	.61	2.204	.089	-
	Middle School	30	3.57	.56			
	High School	43	3.51	.58			
	Bachelor's Degree	77	3.78	.60			
HP	Primary School	50	3.77	.71	2.514	0.60	-
	Middle School	30	3.69	.70			
	High School	43	3.71	.76			
	Bachelor's Degree	77	4.00	.62			
SV	Primary School	50	3.79	.75	2.568	.056	-
	Middle School	30	3.57	.70			
	High School	43	3.48	.83			
	Bachelor's Degree	77	3.86	.84			

* DAL: Digital Age Literacy, IT: Inventive Thinking, EC: Effective Communication, HP: High Productivity, SV: Spiritual Values

According to the data in Table 8, none of the sub-dimensions of 21st-century skills show a statistically significant difference based on the father's education level ($p>0.05$).

Results of high school students' mean scores of 21CSs according to monthly income status are presented in Table 9.

Table 9. *Results of high school students' mean scores of 21CSs according to monthly income status.*

21CSs	Monthly income	N	$\bar{x}$	SD	F	p	Difference
DAL	1000 - 2000 TL	4	3.31	.38	1.208	.308	-
	2001 - 3000 TL	35	3.37	.62			
	3001 - 4000 TL	58	3.48	.52			
	4001 TL and above	103	3.56	.56			
IT	1000 - 2000 TL	4	3.32	.24	.651	.583	-
	2001 - 3000 TL	35	3.63	.55			
	3001 - 4000 TL	58	3.53	.49			
	4001 TL and above	103	3.60	.52			
EC	1000 - 2000 TL	4	3.41	.27	.682	.564	-
	2001 - 3000 TL	35	3.72	.75			
	3001 - 4000 TL	58	3.57	.52			
	4001 TL and above	103	3.66	.59			
HP	1000 - 2000 TL	4	3.50	.35	1.141	.334	-
	2001 - 3000 TL	35	3.77	.75			
	3001 - 4000 TL	58	3.75	.70			
	4001 TL and above	103	3.91	.68			
SV	1000 - 2000 TL	4	3.39	.51	.285	.836	-
	2001 - 3000 TL	35	3.76	.87			

	3001 - 4000 TL	58	3.69	.84
	4001 TL and above	103	3.73	.78

* DAL: Digital Age Literacy, IT: Inventive Thinking, EC: Effective Communication, HP: High Productivity, SV: Spiritual Values

According to the data in Table 9, none of the sub-dimensions of 21CSs show a statistically significant difference based on the monthly income status of the students' families (p>0.05). Another important result obtained from Table 9 is that despite the widening income disparity between the rich and the poor in the 21st-century, this situation has not hindered the development of their children's 21CSs.

Results of high school students' mean scores of 21CSs according to the variable of high school type are presented in Table 10.

Table 10. *Results of high school students' mean scores of 21CSs according to the type of high school attended.*

21CSs	High school type	N	$\bar{x}$	SD	F	p	Difference
DAL	General High School	46	3.45	.60	.791	.500	-
	Anatolian High School	62	3.49	.57			
	Science High School	71	3.57	.50			
	Vocational high School	21	3.39	.62			
IT	General High School	46	3.58	.52	.748	.525	-
	Anatolian High School	62	3.58	.49			
	Science High School	71	3.62	.51			
	Vocational high School	21	3.42	.57			
EC	General High School	46	3.63	.67	1.734	.161	-
	Anatolian High School	62	3.71	.56			
	Science High School	71	3.66	.53			
	Vocational high School	21	3.37	.72			
HP	General High School	46	3.82	.70	1.24	.294	-
	Anatolian High School	62	3.82	.70			
	Science High School	71	3.92	.65			
	Vocational high School	21	3.59	.80			
SV	General High School	46	3.57	.79	.926	.429	-
	Anatolian High School	62	3.76	.73			
	Science High School	71	3.81	.85			
	Vocational high School	21	3.64	.90			

* DAL: Digital Age Literacy, IT: Inventive Thinking, EC: Effective Communication, HP: High Productivity, SV: Spiritual Values

According to the data in Table 10, none of the sub-dimensions of 21CSs show a statistically significant difference based on the type of high school attended by the students (p > 0.05). This result can be attributed to the fact that regardless of the type of high school they attend, all students have access to tablets, computers, and mobile phones in today's world, enabling them to benefit from mass media and social media platforms.

DISCUSSION, CONCLUSION, RECOMMENDATIONS

This research aimed to reveal the development levels of 21CSs among high school students and examine whether these levels create significant differences according to various variables. The study addressed four sub-problems related to gender, parents' education level, monthly income status, and the type of high school attended by the students. The findings of each sub-problem are discussed below.

Regarding the first sub-problem, which focused on the gender variable, the results showed no statistically significant difference in the mean scores of the 21st-century skill sub-dimensions, including DAL, IT, EC, HP, and SV, according to gender. This suggests that both male and female high school students have similar levels of development in 21CSs. When the relevant studies are examined, there are studies that both support (Erkılıç, 2020) and do not support this finding of the research (Engin & Korucuk, 2021; Kan'An, 2018). The study supporting this research finding was conducted by Erkılıç (2020) with undergraduate students, where no significant differences were found in the development levels of any 21st-century skill between male and female students as well. However, contrary to this, Kan'An (2018) figured out that women have significantly

higher levels of 21st-century skills compared to men. Also, in the study conducted by Engin and Korucuk (2021), it was found that male students had significantly higher levels of social responsibility and leadership skills compared to female students. According to these divergent results, it can be stated that the developmental levels of 21CSs do not vary according to gender. These differences can be attributed to cultural values that can still lead to inequalities between women and men in diverse cultures, despite being in the 21st-century. For example, in some societies, women are still not able to move freely outside like men, and as a result, they spend most of their time in enclosed spaces, engaging with mass media, the internet, and social media platforms.

The second sub-problem examined the relationship between the students' development levels of 21CSs and their parents' education level. The analysis of variance results indicated a statistically significant difference in the mean scores of the DAL and HP sub-dimensions according to the mother's education level. However, no significant difference was found in the mean scores of the IT, EC, and SV sub-dimensions. Specifically, students whose mothers had a middle school education and those whose mothers had a bachelor's degree had higher mean scores in these sub-dimensions compared to students whose mothers had a primary school education. This can be attributed to mothers spending more time with their children during their childhood years. Considering that mothers with middle school and university education are more likely to engage with their children in a planned and organized manner, it is expected that the DAL skills of these mothers' children will develop more. Similarly, according to the results of the Tukey analysis, students whose mothers were university graduates had significantly higher average scores in the HP dimension compared to students whose mothers had only completed primary school. This can be explained by the fact that university-educated mothers, due to their experiences in the field of education, can help their children work more systematically and as a result, produce more efficient outcomes. This suggests that maternal education may have an impact on specific aspects of 21CSs development among high school students. On the other hand, none of the average scores for any of the 21CSs sub-dimensions have shown a statistically significant difference based on the fathers' educational levels. This can be attributed to the time fathers spend with their children. Because, regardless of their education level, fathers spend most of their time outside to make ends meet and therefore cannot pay enough attention to their children. When looking at relevant studies, the results of some studies are not consistent with the results of this study. For example, Engin and Korucuk (2021) found a significant difference between fathers' educational levels and students' acquisition of some 21CSs. They have found a statistically significant difference in the Critical Thinking and Problem-Solving Skills Dimension between students whose father's education status was Not Going to School and High School Graduate in favor of students whose father's education status was High School Graduate. A similar difference was also found in the Social Responsibility and Leadership Skills Dimension, and it was observed that there was a statistically significant difference between students whose father's education level was Not Going to School and High School Graduate in favor of students whose father's education level was High School Graduate. This result indicates that sometimes as parents' educational levels increase, students' acquisition, development, and utilization of 21CSs also increase. However, it cannot be stated every time that there is a positive relationship between parents' educational levels and students' development levels of 21CSs.

In relation to the third sub-problem, which focused on the monthly income status variable, the analysis revealed no statistically significant difference in the mean scores of any of the 21st-century skill sub-dimensions based on the students' families' monthly income. This finding suggests that the income disparity between families did not hinder the development of 21CSs among their children. A review of the relevant literature provides some support for this conclusion. For instance, in a study conducted by Alkış (2020) with 572 university students, it was found that the average scores of students in the sub-dimensions of 21st-century information literacy, such as entrepreneurship, personal finance, social systems, bioenergy, media, and health, did not significantly differ based on students' family income levels. However, there was a significant difference in the average scores of the technology and engineering sub-dimensions. Based on this research result carried out by Alkış (2020) and our experience, it can be stated that the economic status of students' families can be considered a factor that may influence the development of 21CSs. Families with better economic status can

afford to send their children to private educational institutions and tutoring centers, arrange private tutors to provide one-on-one lessons in difficult subjects, and easily provide the necessary learning environment and educational materials (such as instructional books, question banks, online tutorial platforms, etc.). This naturally contributes to the improvement of students' academic performance, but it is not sufficient on its own for success. Just as in the past, in the 21st-century, the most fundamental factor for success will continue to be the student themselves. In fact, despite having good economic status and being provided with all the opportunities, there are still students who fail, which indicates that success is not solely dependent on a single demographic variable.

Finally, the fourth sub-problem investigated the relationship between the students' development levels of 21CSs and the type of high school they attended. The analysis of variance results showed no statistically significant difference in the mean scores of any of the sub-dimensions according to the type of high school. This indicates that regardless of the type of high school attended, all students had similar levels of development in 21CSs. Similar findings can be seen when comparing this research with relevant literature. For example, like the findings of this study, a study conducted by Erkılıç (2020) with undergraduate students also found that the development levels of 21CSs did not significantly differ based on the type of high school they graduated from. Another study conducted by Kaya (2017) also indicates that the variable of school type is not a direct influential factor on students' development of 21CSs. This is because, as mentioned earlier, regardless of the type of school they attend, all students have access to social media, the internet, and mass communication tools that contribute to the development of 21CSs in today's world.

Having 21CSs can have a significant impact on students' academic success. 21st-century education is carried out in a period where technological advancements are progressing rapidly. Therefore, students having skills such as accessing information, communication and collaboration, critical thinking, and problem-solving skills, which are considered 21CSs, can help them achieve more effective learning in their classes. For instance, in scientific subjects such as physics, mathematics, chemistry, and biology, it is important for students to have analytical thinking skills and the ability to conduct experiments. Additionally, critical thinking skills are required to solve problems in these subjects. If students' 21CSs are underdeveloped, it can be challenging for them to understand and succeed in these topics.

In conclusion, the findings of this study contribute to understanding the factors that may influence the development of 21CSs among high school students. The results suggest that gender, parents' education level, monthly income status, and the type of high school attended do not significantly impact the overall development of 21CSs among the students. It is important to note that the widespread availability of technology, such as tablets, computers, and mobile phones, may have played a role in providing equal opportunities for accessing information and communication tools, regardless of the socio-economic background or school type. However, it is worth mentioning that this study has certain limitations. The sample size was limited to a specific region or school district, which may limit the generalizability of the findings. Future research could consider larger and more diverse samples to obtain a more comprehensive understanding of the factors influencing the development of 21CSs among high school students.

Overall, this study provides valuable insights into the development of 21CSs among high school students and highlights the need for further research and interventions to promote these skills among all students, regardless of their gender, parental background, income status, or school type.

Conclusions

Based on the findings of the study, several conclusions can be drawn:

1. There is a significant difference in the development levels of high school students' 21st-century skills based on their parents' educational levels. Specifically, students whose mothers had higher levels of education (middle school or university) demonstrated higher average scores in certain dimensions of 21st-century skills, such as decision-making, critical thinking, and problem-solving.

2. Mothers' educational levels play a more significant role than fathers' educational levels in influencing students' 21st-century skill development. This may be attributed to the fact that mothers tend to spend more time with their children and engage in more planned and organized activities, leading to a greater impact on skill development.
3. However, no statistically significant differences were found based on fathers' educational levels. This suggests that fathers' education may have a lesser influence on students' 21st-century skill development compared to mothers' education.
4. The findings of this study align with previous research indicating a positive relationship between parents' educational levels and students' acquisition and development of 21st-century skills.

These conclusions emphasize the importance of parental educational levels in fostering students' 21st-century skill development. It highlights the need for educational policies and interventions that support parents' educational attainment and encourage their active involvement in their children's education. By promoting parents' engagement and providing them with resources, students can enhance their 21st-century skills, leading to their improved academic performance in various subjects such as physics, mathematics, history, geography, English, chemistry, and biology.

Suggestions

Based on the conclusions of the study, here are some suggestions for further actions:

1. Parental Education Programs: In addition to social activities to improve the education levels of parents, various educational activities and projects should be developed where mothers and fathers can spend time together with their children.
2. Parental Involvement Initiatives: Encourage and support parental involvement in their children's education through workshops, seminars, and interactive sessions. Provide parents with information about effective educational strategies and resources they can utilize at home to enhance their children's 21st-century skills.
3. Research and Evaluation: Conduct further research to explore other factors that may influence students' 21st-century skill development, such as socioeconomic status, cultural background, and access to technology. Evaluate the effectiveness of interventions aimed at improving parental educational levels and their impact on students' academic performance and skill development.
4. Collaboration with Community Stakeholders: Engage community organizations, Non-Governmental Organizations (NGOs), and local businesses in initiatives that promote 21st-century skills among students. Foster partnerships to provide additional resources, mentorship programs, and experiential learning opportunities that complement classroom instruction.

By implementing these suggestions, educational systems can create an environment that supports the development of 21st-century skills in students, leading to improved academic achievements and better preparation for the demands of the modern world.

REFERENCES

Agaoglu, O. & Demir, M. (2020). The integration of 21st century skills into education: an evaluation based on an activity example. *Journal of Gifted Education and Creativity, 7*(3), 105-114.

Alkış, M. (2020). *Üniversite öğrencilerinin 21.yüzyıl becerilerinin bazı değişkenler açısından incelenmesi.* (Yüksek Lisans Tezi), Necmettin Erbakan Universitesi Eğitim Bilimleri Enstitüsü, Konya.

Arslankara, V. B. & Ertuğrul, U. (2020). Lise öğrencilerinde sanal risk algısı: Problemli internet kullanımı ve eleştirel düşünme bağlamında bir araştırma. *Ahmet Keleşoğlu Eğitim Fakültesi Dergisi, 2*(1), 134-153.

Atalay, N. & Anagun, S. Ş. (2016). Evaluation of technology integration in science teaching with 21st-century skills: A slowmation application. *Bartın University Journal of Faculty of Education, 5*(2), 405-424.

Barasi, M. & Erdamar, G. (2021). 2018 ortaokul Türkçe dersi öğretim programinin 21. yüzyil becerileri açısından incelenmesi: Öğretmen görüşleri. *Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi, 21*(1), 222-242.

Binkley, M., Erstad, O., Hermna, J., Raizen, S., Ripley, M., Miller-Ricci, M., & Rumble, M. (2012). *Defining Twenty-First Century Skills.* Dordrecht: Springer.

Büyüköztürk, Ş. (2014). *Deneysel Desenler: Öntest-sontest Kontrol Gruplu Desen ve SPSS Uygulamalı Veri Analizi [Experimental Design: Pre-post-posttest Control Group Pattern and SPSS Applied Data Analysis]*. Ankara: Pegem.

Çalışkan, M. & Çoklar, A. (2019). Öğretmen adaylarının özgüvenleri ile teknoloji kullanımları arasındaki ilişkinin incelenmesi. *Ahmet Keleşoğlu Eğitim Fakültesi Dergisi, 1*(2), 86-98.

Durak, D. & Özüdoğru, G. (2023). School principals' technological leadership self-efficacies and 21st century teacher skills. *Ahmet Keleşoğlu Eğitim Fakültesi Dergisi, 5*(2), 330-342.

Eamon, M. (2005). Social-demographic, school, neighborhood, and parenting influences on the academic achievement of Latino young adolescents. *Journal of Youth and Adolescence, 34*, 163-174. doi:10.1007/s10964-005-3214-x

Engin, A. O. & Korucuk, M. (2021). Öğrencilerin 21. yüzyıl becerilerinin çeşitli değişkenler açısından incelenmesi. *Gazi Üniversitesi Gazi Eğitim Fakültesi Dergisi, 41*(2), 1081-1119.

Erdem, A. (2022). The mediating role of coping with stress in problematic internet use and cognitive flexibility relation. *Ahmet Keleşoğlu Eğitim Fakültesi Dergisi, 4*(2), 314-327.

Erkılıç, M. (2020). *21. yüzyıl becerilerinin fizik başarısına etkisinin araştırılması.* (Yayınlanmamış Yüksek Lisans Tezi), Necmettin Erbakan Universitesi, Eğitim Bilimleri Enstitüsü, Konya.

Göktepe Yıldız, S. (2020). Lise öğrencilerinin 21. yüzyıl becerilerinin bazı demografik değişkenler açısından incelenmesi. *Ulakbilge, 51*, 884-897.

Kan'An, A. (2018). The relationship between Jordanian Students' 21st-century skills (Cs21) and academic achievement in science. *Journal of Turkish Science Education, 15*(2), 82-94. doi:10.12973/tused.10232a

Karagöz, Y. (2016). *SPSS 23 ve AMOS 23 Uygulamalı İstatistiksel Analizler*. Ankara: Nobel Akademik Yayıncılık.

Karasar, N. (2014). *Bilimsel Araştırma Yöntemi [Scientific Research Method]*. Ankara: Nobel.

Kavlak, M., Sarılır, A. İ., & Tönbol, B. (2022). Dijital oyun bağımlılığı yalnızlığı tetikler mi? *Necmettin Erbakan Üniversitesi Ereğli Eğitim Fakültesi Dergisi, 4*(1), 1-13.

Kaya, S. (2017). *Lise öğrencilerinin 21. yüzyıl becerilerinin öğrenci tükenmişliği ve okul bağlılığı ile ilişkisi.* (Yayımlanmamiş Doktora Tezi), Hacettepe Üniversitesi Eğitim Bilimleri Enstitüsü, Ankara.

Lemke, C. (2002). *enGauge 21st-century skills: Digital literacies for a digital age* (ED 463 753). Retrieved from Naperville, IL.: https://files.eric.ed.gov/fulltext/ED463753.pdf

Murat, A. (2018). *Investigation of prospective science teachers 21st-century skills competence perceptions and attitudes toward STEM.* (Master Unpublished Master of Science), Fırat University, Institute of Educational Sciences, Elazığ.

Oral, I., & Erkilic, M. (2022). Investigating the 21st-century skills of undergraduate students: Physics success, attitude, and perception. *Journal of Turkish Science Education, 19*(1), 284-301. doi:10.36681/tused.2022.1122

Osman, K., Soh, T. M. T. & Arsad, N. M. (2010). Development and validation of the Malaysian 21st century skills instrument (M-21CSI) for science students. *Procedia-Social and Behavioral Sciences, 9*, 599-603.

Shah, Z., Akhtar, J. & Malik, M. (2020). Exploring the impact of demographic variables gender, parental education and locality on science achievement at 8 th and 9 th grades. *Bulletin of Education and Research, 42*(1), 185-198.

Turiman, P., Osman, K. & Wook, T. S. M. T. (2020). Inventive thinking 21st century skills among preparatory course science students. *Asia Pacific Journal of Educators and Education, 35*(2), 145-170. doi:10.21315/APJEE2020.35.2.9

Ural, A., & Çınar, F. N. (2019). Anne ve babanın eğitim düzeyinin öğrencinin matematik başarısına etkisi *Mehmet Akif Ersoy Üniversitesi Eğitim Bilimleri Enstitüsü Dergisi, 3*(4), 42-57.

Zorlu, Y. & Zorlu, F. (2021). Investigation of the relationship between preservice science teachers' 21st-century skills and science learning self-efficacy beliefs with structural equation model. *Journal of Turkish Science Education, 18*(1), 1-16. doi:10.36681/tused.2021.49

GENİŞLETİLMİŞ ÖZET

GİRİŞ: 21.yüzyıl becerileri üzerinde etkisi olabilecek demografik değişkenlerin incelenmesi, 21. yüzyıl bilgi çağında hem fizik dersinde hem de diğer tüm derslerde öğrencilerin başarısını engelleyen sorunların çözümüne katkıda bulunması ve yeni programlar ile eğitim faaliyetlerine rehberlik etmesi açısından son derece önemlidir. Bu çalışma bazı demografik özelliklerin öğrencilerin 21. yüzyıl becerinin gelişim düzeyleri üzerindeki etkisini araştırmak amacıyla gerçekleştirilmiştir. Çalışma kapsamında lise öğrencilerinin 21.yüzyıl becerilerine cinsiyet, sosyoekonomik durum, ebeveyn eğitimi ve okul türü gibi bazı demografik özelliklerin etkisi incelenmiştir. Bu çalışmanın bulguları, lise fizik eğitimi bağlamında 21.yüzyıl beceri gelişimi üzerine mevcut literatüre katkıda bulunacaktır. Sonuç olarak, lisede fizik dersini alan öğrencilerin 21. yüzyıl becerilerinin gelişim düzeyleri üzerinde demografik özelliklerin rolünü anlamak, kapsayıcı ve etkili eğitim uygulamalarının oluşturulması için önemlidir. Bu çalışmadan elde edilen verilerin tüm öğrenciler için adil beceri gelişimini teşvik eden öğrenme ortamlarının oluşturulmasında eğitim paydaşlarına rehberlik etmesi beklenmektedir.

YÖNTEM: Bu araştırmada betimsel araştırma yöntemlerinden biri olan ilişkisel tarama modeli kullanılmıştır. İlişkisel tarama modeli, birden fazla değişken arasındaki ilişkinin varlığını ortaya koyan bir tarama modelidir(Karasar, 2014). İlişkisel tarama modelinde, değişkenlerin aynı zamanda değişip değişmediği ve eğer varsa bu değişimin nasıl gerçekleştiği belirlenmeye çalışılır. İlişkisel tarama modellerinde elde edilen sonuçlar, araştırmacıya nedensellik açısından bazı içgörüler sağlasa da değişkenler arasında çok kesin bir nedensel ilişki ortaya konulamaz (Büyüköztürk, 2014).

BULGULAR: Tablo 6 verilerine göre çalışmaya katılan lise öğrencilerinin Etkili İletişim (Eİ), Yaratıcı Düşünme (YD), Yüksek Verimlilik (YV), Dijital Çağ Okuryazarlığı (DÇO) ve Manevi Değerler (MD) becerilerine ait puan ortalamaları, cinsiyet değişkenine göre istatistiksel olarak anlamlı bir farklılık göstermemektedir ($p>0.05$). Tablo 7 verilerinden öğrencilerin 21. yüzyıl becerilerinden DÇO ve YV alt boyutları puan ortalamalarının anne eğitim durumuna göre istatistiki olarak anlamlı şekilde farklılık gösterdiği ancak YD, Eİ ve MD alt boyutlarının puan ortalamalarının ise anlamlı bir farklılık göstermediği tespit edilmiştir. Tablo 8 verileri 21.yüzyıl becerilerinin hiçbir alt boyutunun puan ortalamalarının baba eğitim durumuna göre istatistiksel olarak anlamlı bir farklılık göstermediğini göstermektedir ($p>.05$). Tablo 9 verileri 21.yüzyıl becerilerinin hiçbir alt boyutunun puan ortalamalarının, öğrencilerin ailelerinin aylık gelir durumuna göre istatistiksel olarak anlamlı bir farklılık oluşturmadığını göstermektedir ($p>.05$). Tablo 10 verileri 21.yüzyıl becerilerinin hiçbir alt boyutunun puan ortalamalarının, öğrencilerin öğrenim gördükleri lise türüne göre istatistiksel olarak anlamlı bir farklılık oluşturmadığını göstermektedir ($p>0.05$). Bu sonucun, hangi tür lisede öğrenim görürse görsün tüm öğrencilerin günümüzde sahip oldukları tabletler, bilgisayarlar ve mobil telefonlar sayesinde kitle iletişim araçlarından ve sosyal medyadan faydalanabilmelerinden kaynaklandığı söylenebilir.

TARTIŞMA: Bu çalışma, lise öğrencilerinin 21. yüzyıl beceri gelişim düzeylerini araştırmayı ve bu düzeylerin çeşitli değişkenlere göre önemli farklılıklar oluşturup oluşturmadığını incelemeyi amaçlamıştır. Çalışma, cinsiyet,

ebeveyn eğitim düzeyi, aylık gelir durumu ve öğrencilerin öğrenim gördüğü lise türüyle ilgili dört alt problemi ele almıştır. Her alt problemden elde edilen bulgular aşağıda tartışılmıştır.

Cinsiyet değişkenine odaklanan ilk alt sorunla ilgili olarak, sonuçlar, DÇO, YD, İE, YV ve MD gibi 21. yüzyıl beceri alt boyutlarının ortalama puanlarında cinsiyete göre istatistiksel olarak anlamlı bir fark olmadığını göstermiştir. Bu hem erkek hem de kadın lise öğrencilerinin 21. yüzyıl becerilerinde benzer düzeylere sahip olduğunu göstermektedir. İlgili çalışmalar incelendiğinde araştırmanın bu bulgusunu hem destekleyen (Erkılıç, 2020) hem de desteklemeyen (Engin ve Korucuk, 2021; Kan'An, 2018) çalışmalar olduğu görülmektedir. Bu araştırma bulgusunu destekleyen çalışma Erkılıç (2020) tarafından lisans öğrencileriyle gerçekleştirilmiş, kız ve erkek öğrenciler arasında 21. yüzyıl becerilerinin gelişim düzeyleri arasında anlamlı bir farklılık bulunamamıştır. Ancak bunun aksine Kan'An (2018), kadınların erkeklere kıyasla anlamlı düzeyde daha yüksek düzeyde 21. yüzyıl becerilerine sahip olduğunu tespit etmiştir. Ayrıca Engin ve Korucuk (2021) tarafından yapılan çalışmada erkek öğrencilerin sosyal sorumluluk ve liderlik becerilerinin kız öğrencilere göre anlamlı düzeyde daha yüksek olduğu bulunmuştur. Bu farklı sonuçlara göre 21CS'lerin gelişim düzeylerinin cinsiyete göre farklılık göstermediği ifade edilebilir. Bu farklılıklar, 21. yüzyılda olmamıza rağmen hâlâ farklı kültürlerde kadın ve erkek arasında eşitsizliklere yol açabilen kültürel değerlere bağlanabilir.

İkinci alt problem kapsamında, öğrencilerin 21. yüzyıl beceri gelişim düzeyleri ile ebeveynlerinin eğitim düzeyi arasındaki ilişki incelenmiştir. Varyans analizi sonuçları, DÇO ve YV alt boyutlarının ortalama puanlarında annenin eğitim düzeyine göre istatistiksel olarak anlamlı farklılık olduğunu göstermiştir. Bununla birlikte, YD, Eİ ve MD alt boyutlarının ortalama puanlarında anlamlı bir fark bulunmamıştır. Özellikle, anneleri ortaokul mezunu olan öğrenciler ile anneleri lisans mezunu olan öğrenciler, bu alt boyutlarda puan olarak daha yüksek ortalama puanlara sahipken, anneleri ilkokul mezunu olan öğrencilere göre daha yüksek puan almışlardır. Bu, annelerin çocuklarıyla çocukluk yıllarından itibaren daha fazla zaman geçirmesiyle ilişkilendirilebilir. Ortaokul ve üniversite eğitimi almış annelerin, çocuklarıyla planlı ve düzenli bir şekilde ilgilenme olasılıklarının daha yüksek olması göz önüne alındığında, bu annelerin çocuklarının DÇO becerilerinin daha fazla gelişmesi beklenir. Öte yandan, hiçbir 21. yüzyıl beceri alt boyutunun ortalama puanları, babaların eğitim düzeylerine göre istatistiksel olarak anlamlı bir farklılık göstermemiştir.

Üçüncü alt problem kapsamında yapılan istatistiksel verilere göre öğrencilerin ailelerinin aylık gelirine dayalı olarak 21. yüzyıl beceri alt boyutlarının ortalama puanlarında istatistiksel olarak anlamlı bir fark bulunmamıştır. Bu bulgu, aileler arasındaki gelir eşitsizliğinin çocukların 21. yüzyıl becerilerinin gelişimini engellemediğini göstermektedir. İlgili literatür incelendiğinde, bazı sonuçların bu bulguyu kısmen desteklediği görülmektedir. Örneğin, Alkış (2020) tarafından 572 üniversite öğrencisiyle yapılan bir çalışmada, girişimcilik, kişisel finans, sosyal sistemler, biyoenerji, medya ve sağlık gibi 21. yüzyıl bilgi okuryazarlığı alt boyutlarının ortalama puanları öğrencilerin aile gelir düzeylerine göre anlamlı bir şekilde farklılık göstermemiştir. Geçmişte olduğu gibi, 21. yüzyılda da başarının en temel faktörü öğrencinin kendisidir. Aslında, iyi bir ekonomik duruma sahip olmalarına ve tüm fırsatları elde etmelerine rağmen hala başarısız olan öğrenciler olduğu görülmektedir, bu da başarının yalnızca tek bir demografik değişkene bağlı olmadığını göstermektedir.

Son olarak, dördüncü alt problemde, öğrencilerin 21. yüzyıl beceri gelişim düzeyleri ile devam ettikleri lise türü arasındaki ilişki incelenmiştir. Yapılan varyans analizi sonuçlarına göre, hiçbir alt boyutun ortalama puanlarında lise türüne bağlı olarak istatistiksel olarak anlamlı bir fark bulunmamıştır. Bu, hangi lise türünde eğitim aldıklarına bağlı olmaksızın, tüm öğrencilerin 21. yüzyıl becerilerinin benzer düzeylerde geliştiğini göstermektedir. Bu araştırma bulgularını ilgili literatürle karşılaştırdığımızda benzer sonuçlara rastlanmaktadır. Örneğin, Kaya (2017) tarafından gerçekleştirilen çalışma da okul türü değişkeninin öğrencilerin 21. yüzyıl beceri gelişimi üzerinde doğrudan etkili bir faktör olmadığını göstermektedir. Bu sonuç, hangi okulda öğrenim görürse görsün günümüzde tüm öğrencilerin 21. yüzyıl becerilerinin gelişimine katkıda bulunan sosyal medya, internet ve kitle iletişim araçlarına sahip olduklarını ortaya koymaktadır.