



Analysis of Awareness Levels of Students in Science and Art Centers about Web 2.0 Tools

Original scientific paper

Eyup Yünkül¹ and Yeşim Güçlü²

¹Balıkesir University, Türkiye, ²Burhaniye Science and Art Center, Türkiye

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Abstract

This study investigates the awareness levels of highly gifted students attending Science and Art Centers regarding Web 2.0 tools, aiming to address gaps in the literature and inform future research. The primary question explores students' awareness, with sub-questions examining differences by gender, educational level, and grade level. Employing a descriptive survey within a mixed-methods design, the study was conducted in the 2022–2023 academic year at the Edremit and Burhaniye Science and Art Centers (Balıkesir, Turkey). Convenience sampling yielded 302 primary and middle school participants. Quantitative data were collected via the Awareness Scale for Web 2.0 Tools, and qualitative data via semi-structured interviews, enabling a richer interpretation of findings. Results indicate that students perceive Web 2.0 tools as enjoyable, accessible technologies that enrich lesson content, diversify learning opportunities, support visual and auditory engagement, and enhance academic performance and learning permanence. The findings suggest that Web 2.0 tools can be effectively integrated into educational processes and provide actionable insights for subsequent studies.

Keywords: *Web 2.0 Tools, Gifted Students, Education Technology*

Highly gifted people are accepted as individuals who are more curious compared to their peers, who question things and have creative thinking skills. In the education of individuals with such traits, there is a need for a programmed and systematic educational approach that will allow them to use their skills in a more productive manner. Special education programs should be implemented to help these highly gifted individuals to develop these capacities in a more efficient

manner, rather than using their existing capacities. In Turkey, activities in relation to the education of highly gifted individuals have been increasing each day. In fact, while no conferences have been organized for students with special gifts until 2000 in our country, more than ten conferences at a national and international level have been held between 2004-2014 (Sak et al., 2015). During this period, the first Science and Art Center (BİLSEM) founded in 1995, in

Ankara started its activities with the purpose of providing a differentiated education to highly gifted individuals alongside formal education.

Different skills of highly gifted students should be taken into consideration and educational programs should be diversified in line with these differences. In this respect, Kanlı (2011) underlines that a differentiated education program should be created by making the necessary arrangements depending on the students' individual interests and needs. Saadu et al. (2024) point out the importance of teachers, the strategies and approaches to be used by them in the education of highly gifted students. Today, the use of technology has acquired an important place among the different educational approaches with the speedy development of technology. Web 2.0 tools emerge as a significant technological platform, specifically supporting student-oriented processes, encouraging cooperative learning, and providing flexible learning environments independent of time and place. (Yeşil & Aras, 2024). The integration of Web 2.0 tools to education are evaluated as an important development, especially in terms of opening the path for individualized learning. Web 2.0 tools, which contribute to the individual learning processes of highly gifted students and provide differentiated education environments, are widely used in the education of these students. Grosbeck (2009) states that Web 2.0 tools are online applications that make it possible for individuals to actively produce content, create designs, and communicate with others by sharing their content on different platforms.

The education of highly gifted students has increasingly gained more importance with the purpose of maximizing the potential of these individuals, who are few in number in society. In this light, the education of highly gifted students is of critical importance for the future of our country, and special programs need to be implemented during this educational process. In Turkey, Science and Art Centers (BİLSEM) have been founded to develop the individual skills of highly gifted students. In these centers, educational programs that have been enriched with the use of educational materials and strategies suitable for individual differences are being implemented.

Technology's support for individual learning is regarded as an important aspect in the education of highly gifted students. Within this framework, the use of Web 2.0 tools as educational materials supports the active participation and individual learning processes of highly gifted individuals. Web 2.0 tools create permanent and fun learning processes in the education of highly gifted students.

This study aims to analyze the awareness levels of highly gifted students who receive education in Science and Art Centers about Web 2.0 tools. In this respect, this study targets making a significant contribution to remedying the deficiencies in this area and obtaining data for future studies. In addition, this study will be able to provide a new point of view for the Web 2.0 tools awareness levels of highly gifted students who are educated in Science And Art Centers and the use of these tools in the process of education.

The main problem of the study is the identification of the awareness levels of highly gifted students, who are educated in the Science and Art Centers, about Web 2.0 tools. In line with this main problem, the following sub-problems were focused on: Do the awareness levels of highly gifted students about Web 2.0 tools differ in terms of gender?

Do the awareness levels of highly gifted students about Web 2.0 tools differ in terms of level of education?

Do the awareness levels of highly gifted students about Web 2.0 tools differ in terms of grade level?

Method

This study aims to analyze the awareness levels of highly gifted students who receive education in Science and Art Centers about Web 2.0 tools. In the study, the survey model was used, and a descriptive approach was adopted. While Karasar (2016) defines the survey model as a method used to describe a preexisting or current situation as it is, Çepni (2005) states that this method is preferred since it allows the study environment to be analyzed in its natural state.

The study was carried out in Edremit and Burhaniye Science Art Centers in the city of Balıkesir, during the 2022-2023

academic year, and the students' awareness levels about Web 2.0 tools were supported with quantitative and qualitative data. The quantitative data were collected through the awareness scale, while the qualitative data were obtained through the semi-structured interview form.

In this context, the mixed design method was preferred in the study. The use of qualitative and quantitative data together targeted a more in-depth understanding of the study problem.

The sequential transformative design (Creswell, 2003) was used in the study, where firstly the quantitative data were collected, and these were supported with the qualitative data. This design deals with the study subject from different angles and provides a more extensive explanation.

Firstly, the students' awareness levels about the Web 2.0 tools were determined through the quantitative method, and then, in-depth information was collected about the use of these tools through the semi-structured interviews.

Study Group

In the study, the convenience sampling method was used, and 302 primary school and middle school students were included in the sample. This method aims at reaching the conclusion by economizing time, cost, and effort while reaching information and data (Baltacı, 2018). The demographic data of the participants in the quantitative dimension of the study are presented in Table 1.

Table 1.
The Demographic Data of the Students in the Quantitative Study Sample

		N	%
Gender	Female	155	51.3
	Male	147	48.7
Education Level		108	35.8
		194	64.2
Grade Level		10	3.3
		30	9.9
		70	23.2
		43	14.2
		64	21.2
		62	20.5
		23	7.6

Table 2.
The Demographic Data of the Students in the Qualitative Study Sample

		N	%
Gender	Female	10	50
	Male	10	50

Data Collection Tools

The “Awareness Scale for Web 2.0 Tools” was developed by Arslan and Görgülü Arı (2021) as the quantitative data collection tool in the study. The Cronbach’s Alpha reliability coefficient of the scale in the cognition sub-dimension was found as 0.92; in the perception sub-dimension as 0.90, and in the emotion sub-dimension as 0.78. The general Cronbach’s Alpha reliability of the scale was 0.92. The general reliability of the scale obtained in this study was determined as 0.95, reliability in the cognition sub-dimension as 0.88, reliability in the perception sub-dimension as 0.84, and reliability in the emotion sub-dimension as 0.90.

The semi-structured interview form was used to obtain the qualitative data of the study. According to Karasar (2016), the semi-structured interview is a technique where which questions are going to be asked, how they are going to be asked and which data are going to be obtained are determined beforehand and applied as they are. According to Karataş (2017), there is an interview form containing questions that is prepared beforehand in the semi-structured interview. Additional questions can be asked during the interview to go into the details of the data and fill in the missing points. The participants of the study were asked the following eight questions:

1. What do you think about the use of Web 2.0 tools in the lessons?
2. Can you evaluate Web 2.0 tools in terms of their intended purpose?
3. Should Web 2.0 tools be used in the BİLSEM schools? Why?
4. Can you explain the effect of preparing content about a subject using Web 2.0 tools?
5. What effect did the Web 2.0 tools have on your lesson motivation? Can you make an evaluation?
6. Does using Web 2.0 tools increase academic success? Why?
7. Does using Web 2.0 tools worry you? Why?
8. What are your positive and negative views about Web 2.0 tools?

The interviews were arranged in a manner so as not to disturb the lessons of the students and were recorded with a tape recorder. Then, the recordings were

transmitted to digital media. Before recording the interviews, the necessary permissions were taken from the students and the parents. The scale used by the researcher was applied towards the end of the first semester of the 2022-2023 academic year. The semi-structured interviews were done towards the second semester of the 2022-2023 academic year.

Data Analysis

The significance levels of the students in the sample were analyzed in terms of variables such as their awareness levels about Web 2.0 tools, gender, education quality and education level. In order to determine whether the data were distributed normally or not, the normality test was done. The skewness and kurtosis values were analyzed for the data of the awareness scale for Web 2.0 tools. According to Tabachnick and Fidell (2013), if these values are within the -1,5 and +1,5 interval, then it is accepted that there is a normal distribution. In this respect, it can be stated that the data obtained through the awareness scale for Web 2.0 tools used in this study were normally distributed.

When normality was achieved in the data, the independent Groups t Test was used for the gender variable, and the One-Way Variance (ANOVA) was used for the education quality and education level variables for the analyses. In cases where the homogeneity of the variances was not achieved, the Welch test was done. The analysis of the data was performed with the SPSS 22 software and the 5% significance level was taken into consideration in the analyses.

The semi-structured interview form used in the study aims at identifying the views of BİLSEM students on their awareness of Web 2.0 tools. The content analysis method was used for the analysis of the interview data. According to Yıldırım and Şimşek (2016), the main purpose of content analysis is to organize the collected data, interpret them and present them to the reader. In this study, codes were determined by the researcher and the findings were grouped according to these codes in line with the answers of the participants. The answers of the students were presented directly and their names were coded as S1, S2, S3... S20.

Results

With the purpose of obtaining more detailed results within the scope of the study, the descriptive statistical analysis of the items of the awareness scale for Web 2.0 tools

was performed. In Table 3, the descriptive statistics of the BİLSEM students on the items of the awareness scale for Web 2.0 tools are presented.

Table 3.

Descriptive Statistical Results of the items of the Awareness Scale for Web 2.0 Tools

Item	\bar{X}	SD	Skewness	Kurtosis
1. I know that the Web 2.0 tools appeared before me as a result of developing technology.	3.60	1.41	-.66	-.85
2. I can list the contributions of Web 2.0 tools to the lesson process.	3.19	1.34	-.25	-1.03
3. I have the technical skills to use Web 2.0 tools.	3.27	1.38	-.33	-1.06
4. I can give an example or examples to Web 2.0 tools.	3.28	1.40	-.32	-1.13
5. I can distinguish the areas where each of the Web 2.0 tools are used.	3.06	1.31	-.11	-1.02
6. I can save the content I prepare with Web 2.0 tools on my computer or tablet.	3.44	1.41	-.40	-1.15
7. I can use Web 2.0 tools in a speedy and practical manner.	3.34	1.34	-.38	-.92
8. I can produce ideas about how to use the Web 2.0 tool I have newly learned.	3.38	1.34	-.43	-.87
9. I can learn new content produced by Web 2.0 tools.	3.41	1.38	-.41	-1.0
10. I lose track of time, while designing a new product with Web 2.0 tools.	3.14	1.34	-.16	-1.11
11. I can do research on and find the information I need about Web 2.0 tools.	3.44	1.34	-.51	-.86
12. Using the new Web 2.0 tools I come across once is enough for me to learn them.	3.07	1.40	-.15	-1.17
13. I think that Web 2.0 tools create an active participation environment in class.	3.20	1.33	-.13	-1.03
14. I think that I start liking even the subjects I dislike with the help of Web 2.0 tools.	3.03	1.32	-.11	-1.05
15. I think that Web 2.0 tools are an efficient method in the information acquisition process.	3.53	1.34	-.62	-.69
16. I think that Web 2.0 tools increase academic success in lessons.	3.35	1.31	-.44	-.77
17. I think that Web 2.0 tools increase motivation for lessons.	3.36	1.28	-.45	-.67
18. I think that lessons which make use of Web 2.0 tools increase one's focus on the lesson.	3.24	1.33	-.31	-.96
19. It scares me to use Web 2.0 tools."	1.84	1.19	1.29	.70
20. I like using Web 2.0 tools in the learning process.	3.43	1.35	-.47	-.87
21. I think that lessons which make use of Web 2.0 tools are understood in an easier manner.	3.39	1.33	-.44	-.84
22. I think that the use of Web 2.0 tools has benefits for teamwork.	3.44	1.38	-.50	-.91
23. I think that the use of Web 2.0 tools enriches lessons.	3.46	1.33	-.49	-.79
24. The use of Web 2.0 tools during lessons wastes time."0	2.02	1.21	.93	-.13
25. I enjoy talking about Web 2.0 tools with my friends.	2.92	1.34	.00	-1.06
26. It makes me happy to produce new products with Web 2.0 tools.	3.39	1.36	-.40	-.95
27. I get bored while creating content with Web 2.0 tools.	2.02	1.14	.80	-.35
1 st factor: cognition	3.30	1.09	-.57	-.43
2 nd factor: perception	3.15	.99	-.69	-.13
3 rd factor: emotion	2.87	.76	-1.16	1.01
Awareness Scale for Web 2.0 Tools General Average	3.16	.93	-.85	.17

When Table 3 is analyzed, it can be seen that the general average of the awareness level of the students about Web 2.0 tools is at a medium level ($\bar{X} = 3.16$, $SS = 0.93$). It was determined that the averages of the sub-dimensions are at a medium level as well: cognition ($\bar{X} = 3.30$, $SS = 1.09$), perception ($\bar{X} = 3.15$, $SS = 0.99$), and emotion ($\bar{X} = 2.87$, $SS = 0.76$). When the items of the scale were analyzed, it was seen that the item with the highest average was the expression, "I know that the Web 2.0 tools appeared before me as a result of developing technology" ($\bar{X} = 3.60$), whereas the item with the lowest average was, "It scares me to use Web 2.0 tools" ($\bar{X} = 1.84$). As a result, it can be stated that the awareness of the

students about web 2.0 tools is at a medium level. In addition, it was observed that the skewness and kurtosis values of the general average of the scale and the scores obtained from the sub-dimensions were at the ± 1.5 interval and that there were no outliers.

Analysis of BİLSEM Students' Awareness Level about Web 2.0 Tools in Terms of the Gender Variable

The "Independent Groups t Test" was used to analyze whether BİLSEM students' awareness level about Web 2.0 tools displayed differences in terms of the gender variable. The analysis results are presented in Table 4.

Table 4.

Analysis Results of BİLSEM Students' Awareness Level about Web 2.0 Tools in Terms of the Gender Variable

	Gender	N	\bar{X}	SD	df	t	p
Cognition	Female	155	3.31	.97	300	.221	.825"
	Male	147	3.29	1.21			
Perception	Female	155	3.18	.88	300	.496	.620"
	Male	147	3.12	1.11			
Emotion	Female	155	2.90	.70	300	.700	.484"
	Male	147	2.84	.82			
General Average	Female	155	3.18	.81	300	.420	.675"
	Male	147	3.13	1.04			

* $p > .05$

As a result of the analysis, a significant difference was not found between the female students' average ($\bar{X} = 3.18$, $SS = .81$) and the male students' average ($\bar{X} = 3.13$, $SS = 1.04$) in the students' awareness levels about Web 2.0 tools in terms of the gender variable ($t = .420$, $p > .05$). These results indicate that there is no difference in the awareness level about Web 2.0 tools in terms of gender. In addition, a significant difference was not observed in terms of the gender of the students in the scale's Cognition ($t = .221$, $p > .05$), Perception ($t = .496$, $p > .05$) and Emotion ($t = .700$, $p > .05$) dimensions.

Analysis of BİLSEM Students' Awareness Level about Web 2.0 Tools in Terms of the Education Quality Variable

One-Way Variance Analysis (ANOVA) was done to determine whether BİLSEM students' awareness level about Web 2.0 tools displayed differences in terms of the "Education Quality" variable. In this analysis, variance analysis was done for the absolute values of the standard deviations of the observations in each group and the Levene test was performed (Kesici and Kocabaş, 2007). Prior to the ANOVA test, the Levene test was performed to test whether the variances were homogeneous or not and the descriptive analysis results were evaluated. The results of the analysis are given in Table 5.

Table 5.

Homogeneity of the Variances and Descriptive Analysis of BİLSEM Students' Awareness Level about Web 2.0 Tools in Terms of the "Education Quality" Variable

	Education Quality	N	\bar{X}	SD	Levene Test	
					F	p
Cognition	Primary school	108	2.90	1.20	9.409	.002**
	Middle school	194	3.53	.96		
Perception	Primary school	108	2.91	1.19	17.402	.000**
	Middle school	194	3.29	.84		
Emotion	Primary school	108	2.63	.96	50.163	.000**
	Middle school	194	3.01	.58		
General Average	Primary school	108	2.84	1.11	26.685	.000**
	Middle school	194	3.33	0.76		
	Total	302	3.16	.93		

*p<.05

As a result of the analysis, it was seen that the BİLSEM students' awareness level about Web 2.0 tools displayed a difference in terms of the "Education Quality" variable. The average awareness level of the middle school students ($\bar{X} = 3.33$, $SS = .76$) was found higher than the average awareness level of the primary school students ($\bar{X} = 2.84$, $SS = 1.11$).

In the cognition sub-dimension, the average of the middle school students ($\bar{X} = 3.53$, $SS = .96$) is higher compared to the average of the primary school students ($\bar{X} = 2.90$, $SS = 1.20$).

In the perception sub-dimension, the average of the middle school students ($\bar{X} = 3.29$, $SS = .84$) is higher compared to the average of the primary school students ($\bar{X} = 2.91$, $SS = 1.19$).

In the emotion sub-dimension, the average of the middle school students ($\bar{X} = 3.01$, $SS = .58$) is higher compared to the average of the primary school students ($\bar{X} = 2.63$, $SS = .96$).

According to the Levene test results, it was seen that the variances were not

homogenous ($F = 26.685$, $p < .05$). In cases where the variances are not homogenous and other hypotheses cannot be achieved, the Welch and Brown-Forsythe tests are alternative methods used instead of the F test (Çelik, 2021). In this study, the Welch test was used, where homogeneity could not be achieved. In addition, a One-Way Variance Analysis test was done considering that the data displayed normal distribution in terms of education quality (skewness and kurtosis $< \pm 1.5$). The results of the analysis are given in Table 6.

According to the One-Way Variance Analysis results, the general average of the scale for determining the awareness level of BİLSEM students about Web 2.0 tools displays a significant difference in terms of the education quality variable ($F=20.318$, $p<.05$). It was observed that education quality influences the awareness level of BİLSEM students about Web 2.0 tools. Significant differences were found in the scale's Cognition ($F=24.291$, $p<.05$), Perception ($F=10.522$, $p<.05$) and Emotion ($F=17.883$, $p<.05$) sub-dimensions as well.

Table 6.

One-Way Variance Analysis Results of BİLSEM Students' Awareness Level about Web 2.0 Tools in Terms of the "Education Quality" Variable

	Education Quality	Sum of squares	Sd	Average of squares	Levene Test	
					F	p
Cognition	Between groups	27.165	1	27.165	24.291	.000*
	Within group	335.503	300	1.118		
	Total	362.668	301			
Perception	Between groups	10.176	1	10.176	10.522	.001*
	Within group	290.144	300	.967		
	Total	300.320	301			
Emotion	Between groups	9.874	1	9.874	17.883	.000*
	Within group	165.644	300	.552		
	Total	175.518	301			
General Average	Between groups	16.631	1	16.631	20.318	.000*
	Within group	245.557	300	.819		
	Total	262.188	301			

*p<.05

As a result of the Levene test performed to determine whether the variances are equal, it was seen that the variances are not homogeneous ($p<.05$). According to the Welch ANOVA results, the lowest average for Web 2.0 tools awareness was found in the Emotion sub-dimension ($\bar{X} = 2.87$, $SS = 1.11$), whereas the highest average as found in the Cognition sub-dimension ($\bar{X} = 3.30$, $SS = 1.09$). A significant difference was found in education quality between the sub-dimensions (Welch $F(1, 163.698) = 16.493$, $p<.05$).

Analysis Results of BİLSEM Students' Awareness Level about Web 2.0 Tools in Terms of the Education Level Variable

One-Way Variance Analysis (ANOVA) was done to determine whether BİLSEM students' awareness level about Web 2.0 tools displayed differences in terms of the "Education Level" variable. Variance analysis was done for the absolute values of the standard deviations of the observations in each group and the Levene test was performed (Kesici and Kocabaş, 2007). Prior to the ANOVA test, the Levene test was performed to test whether the variances were homogeneous and descriptive analysis was done. The results of the analysis are given in Table 7.

Table 7.

Homogeneity of the Variances and Descriptive Analysis of BİLSEM Students' Awareness Level about Web 2.0 Tools in Terms of the "Education Level" Variable

	Education Level	N	\bar{X}	SD	Levene Test	
					F	p
Cognition	2 nd Grade	10	2.54	1.11	2.449	.0025**
	3 rd Grade	30	3.05	1.25		
	4 th Grade	70	2.86	1.19		
	5 th Grade	43	3.25	.99		
	6 th Grade	64	3.62	.85		
	7 th Grade	62	3.65	.95		
	8 th Grade	23	3.57	1.09		
Perception	2 nd Grade	10	2.56	1.15	3.437	.003**
	3 rd Grade	30	3.27	1.15		
	4 th Grade	70	2.80	1.17		
	5 th Grade	43	3.05	.8		
	6 th Grade	64	3.33	.86		
	7 th Grade	62	3.41	.76		
	8 th Grade	23	3.35	.96		
Emotion	2 nd Grade	10	2.53	1.09	9.677	.000**
	3 rd Grade	30	2.81	.82		
	4 th Grade	70	2.57	.9		
	5 th Grade	43	2.90	.65		
	6 th Grade	64	3.02	.48		
	7 th Grade	62	3.09	.56		
	8 th Grade	23	2.99	.73		
General Average	2 nd Grade	10	2.54	1.11	5.304	.000**
	3 rd Grade	30	3.07	1.08		
	4 th Grade	70	2.77	1.11		
	5 th Grade	43	3.11	.78		
	6 th Grade	64	3.39	.68		
	7 th Grade	62	3.45	.72		
	8 th Grade	23	3.37	.93		

*p<.05

As a result of the analysis, it was seen that the highest average according to the students' education level in the data of the scale designed to determine the awareness level of BİLSEM students about Web 2.0 tools belongs to the 6th grade students (=3.39. SS=.68), whereas the lowest average belongs to the 2nd grade students (=2.54. SS=1.11). In the cognition sub-dimension, the highest average belongs to the 7th grade students (=3.53. SS=.96), while the lowest average belongs to the 2nd grade students (=2.90. SS=1.20). In the perception sub-dimension,

the highest average belongs to the 7th grade students (=3.41. SS=.76), while the lowest average belongs to the 2nd grade students (=2.56. SS=1.15). Lastly, in the emotion sub-dimension, the highest average belongs to the 7th grade students (=3.09. SS=.56), while the lowest average belongs to the 2nd grade students (=2.53. SS=1.09). One-Way Variance Analysis was done to determine whether there was a difference between the score averages in terms of education level. According to the ANOVA test, a significant difference was found in the awareness level

about Web 2.0 tools in terms of the education level variable. Post-hoc analysis was done to determine this difference. In cases where the variances were not homogeneous, Tamhane, Dunnett T3, and Games-Howell tests were found more suitable among the multiple

comparison tests (Çelik, 2021). Since variance equality could not be achieved, the Games-Howell test was applied in this study as well. The results of the analysis are presented in Table 8.

Table 8.

One-Way Variance Analysis Results of BİLSEM Students' Awareness Level about Web 2.0 Tools in Terms of the Education Level Variable

	Education Level	Sum of squares	Sd	Average of squares	Levene Test		
					F	p	Significant difference
Cognition	Between groups	37.493	6	6.249	5.669	.000**	4.< 6.7.
	Within group	325.175	295	1.102			
	Total	362.668	301				
Perception	Between groups	20.193	6	3.365	3.544	.002**	
	Within group	280.127	295	.950			
	Total	300.320	301				
Emotion	Between groups	12.284	6	2.047	3.700	.001**	
	Within group	163.234	295	.553			
	Total	175.518	301				
General Average	Between groups	24.122	6	4.020	4.982	.000**	
	Within group	238.066	295	.807			
	Total	262.188	301	6.249			

According to the results of the ANOVA test, it was found that the awareness level of BİLSEM students about Web 2.0 tools in terms of the education level variable displayed a significant difference ($F=4.982$, $p<.05$). This finding shows that education level is effective on the awareness level of BİLSEM students about Web 2.0 tools.

In addition, significant differences were observed in the scale's "Cognition" ($F=5.669$, $p<.05$), "Perception" ($F=3.544$, $p<.05$) and "Emotion" ($F=3.700$, $p<.05$) sub-dimensions as well. As a result of the analysis of these differences, it was found that the average values of the 4th grade students are lower compared to the average values of the 6th 7th grade students.

Findings on BİLSEM Students' Use of Web 2.0 Tools in their Lessons

The interviewed students stated their positive (S1-S2-S3-S4-S6-S8-S9-S10-S11-S12-S13-S14-S16-S17-S18-S19) and negative (S5-S7-S15-S20) views on the use of Web 2.0 tools. The students found the use of Web 2.0 tools in their lessons beneficial (S2-S9-S19), fun (S3-S8-S10), and interesting (S1-S14). In addition, they expressed positive views stating that these tools facilitate understanding the lesson by enriching lesson activities (S 6- S 11-S13- S 17), the students' active participation (S4-S16), and making the learned information permanent (S12-S18). As for their negative views, they expressed security problems (S7), technology addiction (S20), laziness

(S15), and problems in time management (S5). The answers of the students are indicated as quotes below:

S1: "Web 2.0 tools make the lessons more interesting."

S2: "The use of Web 2.0 tools in the lessons is beneficial."

S5: "You can lose track of time while using the application."

S6: "Web 2.0 tools allow us to better understand the lessons."

S7: "Security problems can occur due to mail addresses with passwords."

S8: "Web 2.0 tools make the lesson sources fun."

S11: "They diversify and enrich the lesson activities."

S12: "Having the chance to repeat the information to be learned with Web 2.0 tools increase the permanence of information."

S15: "You can lose track of time while using the application."

S17: "Repeating the subjects make it easier for me to understand them."

S18: "Makes knowledge permanent through countless practice."

S19: "I believe that their frequent use in the lessons will be beneficial for the students."

S20: "Continuous use may cause technology addiction."

As can be understood from the students' answers, they expressed the most that the use of Web 2.0 tools is beneficial and fun. It was seen that Web 2.0 tools are accepted by the students and receive interest. As Web 2.0 tools give the students a chance to do applications, they contribute to the lessons by making them fun and making active participation of the students possible. When the negative views were analyzed, the students stated that the time spent on the internet can increase and cause addiction and that it may harm time management. In addition, they expressed that sharing personal data entered for the applications can cause security problems.

Findings on BILSEM Students' Views on the Purpose of Using Web 2.0 Tools in their Lessons

When the students' views on the purpose of using Web 2.0 tools in education, a majority of the students stated that they use these tools to do research (S1-S3-S6-S14-S16-S20). They expressed that they prefer to use these tools in their lessons to

do presentations (S5-S8-S11-S18), create content (S2-S7-S13-S15-S17), recitation (S9-S10-S12), and do subject repetitions (S4-S19). The answers of the students about the purpose of using these tools are indicated as quotes below:

S3: "I use to do for research and to consolidate knowledge. I believe that they are effective in consolidation as well."

S4: "They are used for subject repetition and studying for the lessons."

S8: "They create a different medium for preparing presentations."

S9: "Their use in lectures increases my interest in the lessons."

S13: "Directly presenting the information and method needed to create a project or content has made Web 2.0 tools effective."

According to the students' answers, it was seen that the purpose of using Web 2.0 tools is to develop lesson content. These tools improve the lesson process and make it possible to do research on the subjects, present them, and do repetitions. These findings show that Web 2.0 tools can enrich the learning process and make it more effective.

Findings on BILSEM Students' Views on the Effects of Using Web 2.0 Tools on Anxiety

When it was analyzed whether the use of Web 2.0 tools create anxiety, it was seen that all of the students answered, 'They do not create anxiety.' The students expressed that Web 2.0 tools are easy to use (S1- S4-S11- S13- S14-S18-S19), they give the opportunity to test them (S2-S3-S5-S7-S8-S9-S12-S15-S20), and stated that a tool helps to learn another tool (S6-S10-S16-S17). The answers related to the effects of Web 2.0 tools on anxiety are indicated as quotes below:

S1: "They do not create anxiety. I follow the instructions while using these tools and can easily apply them."

S4: "They do not create anxiety. When there is a part I don't understand, I think that I will easily find the solution since they are easy to use."

S6: "They do not create anxiety. When I experience problems with using them, I connect to the previous Web 2.0 tool I have learned and produce solutions."

S8: "They do not create anxiety. Since they are applied repetitiously, I do not worry when

I make a mistake.”

S12: “They do not create anxiety. Since they give you the chance to do repetitions, they do not create the fear of making mistakes.”

S17: “They do not create anxiety. I can make use of the previous application I have learned to transfer my knowledge.”

The students stated that Web 2.0 tools do not cause anxiety and that they are easy to use. They expressed that doing repetitions with Web 2.0 tools makes the learning process flexible and removes anxiety. They stated that a previously learned Web 2.0 tool gives the opportunity to do a positive transfer of knowledge while learning a new tool, and they are easy to learn. They in particular underlined that as grade level and age increase, students gain more experience and using these tools does not worry them for this reason.

Findings on BILSEM Students’ Views on the Effects of Web 2.0 Tools on Motivation and Academic Success

When the students’ views on the effects of Web 2.0 tools on motivation and academic success were analyzed, it was seen that a majority of the students answered that it increases motivation and academic success (S1-S2-S3.....S20). The students stated that Web 2.0 tools’ enrichment of the lesson content increases their interest in the lessons (S1-S3-S7-S8-S12-S17) and affects motivation. In addition, they expressed that these tools make the learned information permanent (S4-S6-S10-S13-S14-S16-S19-S20) and consolidate knowledge (S2-S5-S9-S11-S15-S18), which in turn increases academic success. The students’ views on motivation and academic success are indicated as quotes below:

S3: “Web 2.0 tools increase my motivation for the lesson. Since they present the subjects visually and audially, they increase motivation.”

S4: “Web 2.0 tools present visual and audial opportunities while studying for the exams. They increased the permanence of information.”

S5: “They increase success. I use Web 2.0 tools to consolidate my knowledge for the exams.”

S6: “They increase academic success. They help me learn information in a permanent and fun manner. Therefore, I can get prepared for the exams.”

S7: “Lessons done with Web 2.0 tools increase my motivation for the lessons. While using Wordwall to consolidate the lesson, my interest in the lesson increased and the learning process became fun.”

S8: “Lessons done with Web 2.0 tools increase my motivation. They make the lessons fun and productive. Actively participating in the lessons increases my interest in the lessons.”

S19: “I do not forget information I learn visually and audially with Web 2.0 tools. My learning becomes permanent.”

S20: “Since I can access them whenever I want and practice informational activities, they increase the permanence of information.”

The analyses show that Web 2.0 tools make the lessons interesting and increase the students’ motivation. The lessons organized with these tools present visual and audial opportunities and strengthen the motivation of the students for their lessons.

It is stated that the learning processes of those students who feel motivation for their lessons are more productive and as a result, their academic success is positively affected. In addition, Web 2.0 tools provide the opportunity to access the desired information in a timely manner, increase the permanence of information and support academic success. These points were openly stated by the students.

Discussion and Conclusion

The analyses performed with the purpose of determining the awareness level of highly gifted students about Web 2.0 tools show that the scale average ($x=3,16$) is at the “Undecided” level. This finding leads us to think that the students do not have in-depth knowledge about Web 2.0 tools. A significant difference was not found according to the statistical analysis results about the awareness level of highly gifted students about Web 2.0 tools in terms of gender. This shows that female and male students’ awareness level about Web 2.0 tools are similar. While the female students’ scale average is at the “Undecided” level ($x=3,18$), it was seen that the male students’ scale average was ($x=3,13$) at the same level as well.

The findings of this study shed light on previous studies with similar findings.

For instance, in Bayra and Kaya's study (2020), a significant difference was not found in terms of gender when highly gifted students' self-sufficiency in technology and design was analyzed. In Yu and Deng's study (2022), in which highly gifted students' self-learning through technology was analyzed, a significant difference was not found in terms of the gender variable. In Kurnaz and Tepe's study (2019), a significant difference was found in highly gifted students' level of making use of information technologies in terms of gender. In Liu et al.'s study (2021), in which the relationship between highly gifted students' attitude toward computers and self-learning through technology was analyzed, a significant difference was found in terms of gender.

The statistical analyses performed in terms of the education quality variable of the awareness scale about Web 2.0 tools of the highly gifted students who participated in the study displayed a significant difference. The primary school students' scale average ($x=2,84$) is at the "Undecided" level and the middle school students' scale average ($x=3,33$) is again at the "Undecided" level. The obtained findings show that middle school students' awareness about Web 2.0 tools is higher. This can be interpreted as students' acquiring higher awareness as they get older.

Similarly, highly gifted students' self-sufficiency in technology and design was analyzed in Bayra and Kaya's study (2020) and significant differences were observed in terms of education quality. This study involved students who went to normal middle schools and religious vocational schools (imam hatip schools) and it was found that the average of the students who went to normal middle schools was higher compared to religious vocational school students.

In Yu and Deng's study (2022) on highly gifted students' self-learning through technology, primary, middle and secondary education students were included and significant differences were found between the groups. It was observed that the scale average of the students continuing secondary education was higher. This result shows that students' self-learning through technology increases as they get older.

In Çevik et al. (2021) on highly gifted students' level of benefitting from information technologies, an analysis was

done on middle and high school students and it was found that there was no significant difference when the two levels were classified as private and state schools. In Liu et al (2017) in which the relationship between highly gifted students' attitude towards computers and self-learning through technology was analyzed, it was observed that there was no significant difference in the attitudes of highly gifted students towards computers.

The statistical analyses performed in terms of the education level variable of the awareness scale about Web 2.0 tools of the highly gifted students who participated in the study displayed a significant difference. While the lowest item average was determined as "I do not agree" at the 2nd grade level ($x=2,54$), the highest item average was determined as "I agree" at the 7th grade level ($x=3,45$). These findings suggest that as grade level increases, awareness about Web 2.0 tools increases as well.

Similarly, in Bayra and Kaya's study (2020) on highly gifted students' self-sufficiency in technology and design, significant differences were observed in terms of education level. In this study, middle school students were analyzed and it was found that the highest scale average belonged to the 6th grade students, whereas the lowest scale average belonged to the 8th grade students. It is considered that the high average of the 6th grade students was due to weak participation.

Significant differences were also found in Yu and Deng's study (2020) in which highly gifted students' level of self-learning through technology was analyzed. In particular, it was observed that the differentiation was more emphasized at the primary school level. This might be due to primary school students' low academic sufficiency and cognitive skills. In Çevik et al.'s study (2021) highly gifted students' level of benefitting from information technologies was analyzed between 5th-11th grade students, and a significant difference in terms of the education level variable was not found. In this study, the highest average of benefitting from information technologies belonged to the 9th grade students, whereas the lowest average belonged to the 5th grade students.

As a result, it was determined that the awareness level of primary and middle

school BİLSEM students about Web 2.0 tools is at a medium level. While a significant difference was observed in the gender variable, a significant difference was not found in terms of the education level and education quality variables.

In this study, the views of highly gifted students receiving education in Science and Art Centers about Web 2.0 tools were collected through a semi-structured interview form. According to the results, a great majority of the students expressed positive views about Web 2.0 tools. The students expressed that lessons prepared with these tools are beneficial, interesting and fun. Web 2.0 tools provide visual and audial opportunities with the active participation of the students and diversifying the lessons and this increases students' desire to use these tools. Research has demonstrated that Web 2.0 tools, such as Kahoot!, positively influence academic achievement, with studies reporting favorable student perceptions and enhanced engagement in activities designed using these platforms (Cumhur & Çam, 2021; Göksün & Gürsoy, 2019; Klimova & Kacetl, 2023; Özdemir, 2025; Sandoval-Hernández et al., 2023; Wang & Tahir, 2020). It was stated that Kahoot enriches students' learning processes. Yıldız and Ateşli (2022) state that Web 2.0 tools help the students keep up with their period of time and contribute to having enriched learning experiences and a productive educational process.

In Karadağ and Garip's study (2021), the views of 6th grade students on the LearningApps application were analyzed, and it was concluded that this tool is fun, educational, and encourages active participation of students. Among the negative comments of the students, it was expressed that being intertwined with technology might cause concerns about the safety of personal data, lead to problems concerning time management and the time spent in front of computers might lead to laziness.

When the students' views on the purpose of using Web 2.0 tools in the lessons were analyzed, it was seen that the students expressed that these tools are used to do research, create content, consolidate knowledge, subject repetition, and prepare presentations. The students stated that they aim to enrich lesson content with Web 2.0 tools and make the lessons more interesting.

When they were asked whether the use of Web 2.0 tools creates anxiety, all of the students replied, "It does not create anxiety." They supported their views with aspects such as these tools being easy to use, learning about one tool facilitating other applications, and providing opportunities to correct mistakes.

In the evaluations on the effects of Web 2.0 tools on motivation and academic success, the students stated that these tools increase motivation and academic success. They expressed that Web 2.0 tools increase interest in the lessons, make knowledge permanent, and provide the opportunity to consolidate knowledge, leading to an increase in academic success. In the study carried out by Müldür and Çevik (2014), it was underlined that learning processes which give the students the opportunity to do applications increase the permanence of knowledge. In Tenekeci's study (2020), it was concluded that the visual and audial opportunities provided by web applications increase the willingness to participate in the lessons. Ovalı (2011) showed that the education processes realized through Web 2.0 tools have a positive effect on academic success. In some studies (Ergül Sönmez & Çakır, 2021; Demirezer, 2023; Hew & Cheung, 2013). In Zhao's study (2019), it was shown that activities done with Quizizz increase the success of the students.

As a result, Web 2.0 tools are regarded as web technologies which enrich the learning environment and provide different learning opportunities. Students find the use of Web 2.0 tools fun, beneficial and interesting. These tools being easy to use, enriching lesson content and increasing academic success underline the importance of their use in the lessons. The important findings of this study are that these tools increase the interest of the students in the lessons and make knowledge permanent and have a positive effect on academic success. The findings show that Web 2.0 tools can be used in an efficient manner in education. Web 2.0 tools are important for learning processes since they are easy to use, present the lesson activities in an enriched manner visually and audially and increase academic success. It is considered that the findings of this study will guide future studies.

This study provides valuable implications for future research on

technology integration in the education of gifted students. By revealing the medium-level awareness of Web 2.0 tools among Science and Art Center students, the research identifies a gap that subsequent studies can further investigate. Future researchers can build upon these findings by exploring intervention strategies that enhance students' cognitive, emotional, and perceptual engagement with Web 2.0 tools. Moreover, these results enrich the current literature by highlighting the role of digital tools in promoting differentiated learning opportunities, particularly for gifted students whose educational needs differ from the mainstream population. In practice, the discussions presented in this study can address some of the recurring challenges observed by experts, such as sustaining student motivation, improving retention of knowledge, and fostering collaborative learning environments. By integrating Web 2.0 tools more systematically, practitioners can create flexible and student-centered educational processes. Thus, this study not only fills a research gap but also provides actionable insights that can guide both academic and practical efforts in the field of educational technology.

Recommendations

The following suggestions were developed with the purpose of increasing the highly gifted students' awareness level of Web 2.0 tools to the "I completely Agree" level:

1. The organization of various supporting activities can be encouraged to increase the awareness of highly gifted students about Web 2.0 tools.
2. Effort can be spent on highly gifted students to use Web 2.0 tools more often in their lesson activities.
3. Web 2.0 tools training and in-service training for the integration of these tools to the lessons can be given to teachers who teach the highly gifted students.
4. It can be suggested to add a module on teaching Web 2.0 modules to the curriculum of highly gifted students in BİLSEM schools.
5. The use of Web 2.0 tools can be encouraged to develop the creativity of highly gifted students.
6. Education opportunities in line with the gains indicated by the Ministry:

Opportunities that will develop the students' individual growth and their skills through Web 2.0 tools can be provided in line with the gains indicated by the Ministry.

7. Activities which increase the feeling of curiosity: The opportunity to work on different activities on digital media can be provided to increase the curiosity of highly gifted students.
8. Analyzing the differences between teaching techniques: Analyzing the differences between traditional teaching methods and techniques which make use of Web 2.0 tools in the lessons of highly gifted students can set an example for future implementations.
9. Evaluation of demographic information: The awareness levels about Web 2.0 tools in different school types can be evaluated by analyzing the demographic information of students' schools.

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