The Relationship Between Bilsem Teachers' Teaching Motivations and Digital Material Design Competencies

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Article Info	ABSTRACT

In this study, the relationship between teaching motivation and digital material design competencies of teachers working in Science and Art Centres (BİLSEM) was examined. Research data were obtained from teachers working in BİLSEMs in the 2022-2023 academic year. In the research, mixed method was used in which quantitative and qualitative data were handled together. In the quantitative dimension of the research, gender and professional seniority differences between digital material design competencies and teaching motivation were examined with the data obtained from 106 teachers working in BİLSEMs across Turkey. In the qualitative dimension of the study, data were collected from 12 teachers working in a BİLSEM in the Western Black Sea Region with a semi-structured interview form. According to the results of the analyses, it was seen that BİLSEM teachers' digital material design competencies were at a high level. Teachers' intrinsic and extrinsic motivation levels were found to be at medium level. No significant difference was found between teachers' digital material design competencies and teaching motivation and gender and professional seniority variables. It was determined that there was a moderate positive relationship between teachers' digital material design competences and their teaching motivation (intrinsic-extrinsic). As a result of the research, it was revealed that teachers need training on current issues such as artificial intelligence, augmented reality, virtual reality.

INTRODUCTION

Discovering the talents of gifted students at an early stage and ensuring that they receive education in accordance with their talents will contribute to countries' skilled workforce. Many countries make special efforts to educate gifted students for the benefit of humanity and society, and carry out studies in this field (Kurtdaş, 2012). The concept of special talent is expressed as "gifted, gifted and gifted/talented children" in different sources. In the Ministry of National Education Special Education Services Regulation, the concept of gifted individual is used (Gürler, Şahin & Akdal, 2023). Individuals who perform at a higher level than their peers in intelligence, creativity, art, leadership capacity, motivation or special academic areas are defined as gifted (Bilgiç, 2013). In 1995, Science and Art Centres (BİLSEM) were established under the General Directorate of Special Education, Guidance and Counselling Services of the Ministry of National Education in order to support the talents of gifted students outside of school. Through these schools, it is aimed to meet the educational needs of gifted children and to prevent the neglect of their emotional and social needs (Özbay, 2013). In Turkey, 67,375 students receive education in 355 BİLSEMs in 81 provinces (Ministry of National Education [MoNE], 2022). While selecting students for BİLSEMs, firstly, students who are considered to be gifted by their primary school teachers are taken to individual examinations by the experts in Special Education Guidance and Research Services, and then those who are decided to be gifted are directed to BİLSEMs (Ulusoy et al., 2014). In these schools, which have the mission of developing projects for all kinds of production, design, technology, and services, students receive project-based education in addition to their formal education (Özbay, 2013). Teachers who will provide education to these special students should have teaching skills in different fields in order to prepare education and training environments. Among these skills, "differentiated education" and the evaluation of this education are areas that require expertise (Köksal, 2021). MoNE assigns teachers to work in these schools within the framework of certain criteria. These criteria are; being a graduate of gifted education, having a master's degree with thesis, having a doctorate, certificates of achievement, certificates of appreciation, taking part in projects and some competences such as knowledge of foreign languages. The evaluation commissions established within the Provincial Directorates of National Education score these competences and assignment points. Then teachers are intervewiewed to measure their communication skills, self-confidence and persuasiveness ability to comprehend and express a subject and reasoning power, openness to scientific and technological developments, merit and ability to represent in front of the public, up-to-date knowledge, creativity and willingness. Teachers are appointed to BİLSEMs at the end of the process according to the total points calculated by taking 60% of the score calculated by the Provincial Directorates of National Education and 40% of the oral exam score and the superiority of the score (MoNE, 2023).

In the digital age, countries expect teachers to equip their students with 21st century skills such as critical thinking, creativity and complex problem solving in order to prepare their citizens for the future. This expectation requires the development of new approaches in education systems in general and in the education of gifted students in particular, and requires teachers to create educational environments that can meet the individual needs of students (Kanlı, 2021a). It is vital that teachers have the belief and motivation that they can teach gifted students. The high motivation of the teacher will positively affect his/her motivation to teach the students. Motivation, which is defined as the source of desires, wishes, needs and impulses of individuals (Kurt, 2013), is the sum of motives that activate individuals (Genç, 2012). Motivation, which is an important factor that affects job satisfaction, is divided into two groups: intrinsic and extrinsic motivation. Some individuals are motivated by internal sources, while others are motivated by external factors (Aslantaş et al., 2018; Ünal & Bursalı, 2013). Teacher motivation has an important role in the success of schools (Ada et al., 2013). High teacher motivation is among the important elements of the realisation of educational reforms (Neves & Conboy, 2001). Teacher motivation is an important factor that positively affects the student-teacher relationship (Kılıç, 2019). Teachers' ability to increase student motivation is related to motivation and self-efficacy towards teaching (Candan, 2019).

It is known that the extrinsic motivation of gifted students is lower than their intrinsic motivation (Kanlı, 2021b). These students need extrinsic motivational support such as teacher support. If these students cannot be educated in accordance with their capacities, they may have difficulties in self-actualisation (Kaya, 2013). Gifted students also receive education in BİLSEMs in addition to school education with their other peers. This situation may sometimes cause students to experience time management problems and decrease their motivation (Şahin, 2014). In order to overcome students' lack of motivation, teachers should be experienced about gifted students and participate in professional development programmes from time to time (Yıldız, 2010). Methods such as programmed teaching, independent studies, multiple intelligence method, interactive material design, project-based learning and interdisciplinary enrichment techniques are used in the education of these students (Göksu, 2021; Özbay, 2013). In these institutions, various workshops are organised in accordance with the interests and abilities of the students. These programmes include digital-focused workshops such as digital design, games and animation, renewable energy, robotic coding, software and hardware, ardunio, mechatronics, 3D design, STEM and artificial intelligence (Göksu, 2021). Teachers working in these workshops provide guidance and consultancy to students in developing projects in addition to their usual lessons. The ability of gifted students to develop projects using digital materials is strongly related to teachers' competences in digital material design. New technologies force teachers to develop their skills in different areas and transform education from traditional to digital-based methods (Pettersson, 2018). The acquisition of these competences by teachers will help students to use new technologies and to already have the necessary skills for future professions (Elsayary, 2023). Increasing the digital competences of teachers will contribute to the development of students' digital literacy skills, access to information and analytical thinking skills (Olpak, 2023). In order for teachers to use their digital competences effectively in students' learning processes, they should also have the pedagogical dimension of technology. However, the pedagogical aspect of digital competence is quite complex (Pettersson, 2018) and teachers often neglect the pedagogical dimension of digital technologies (Gellerstedt, Babaheidari & Svensson, 2018; Lucas, 2021). Teachers generally focus on the use of technology and fail to develop a technological pedagogical perspective (Gellerstedt, Babaheidari & Svensson, 2018). In the European Competence framework published by DigCompEdu, in which the digital competences of educators are determined, it is stated that educators do not have difficulty in using technology, but they have difficulty in using digital technologies by integrating them into education and training processes (Lucas, 2021). Shulman (1986) emphasises the concept of "Pedagogical Content Knowledge" for the necessity of using teachers' content knowledge and pedagogical knowledge together in education. Mishra and Koehler (2006) developed the Technological, Pedagogical and Content Knowledge (TPACK) model by adding the technology dimension to the concept developed by Shulman. Teachers need to have technological and pedagogical knowledge, i.e. TPACK competences, together with their content knowledge in order to integrate ICT and advanced teaching methods (Gellerstedt, Babaheidari & Svensson, 2018). Teachers, who have a critical role in the education of gifted students, do not receive the necessary training to create special programmes for gifted students during their university education (Yılmaz & Yılmaz, 2017). For these students, educational environments where innovative technologies are used in accordance with the conditions of the age (Türksoy & Karabulut, 2020; Ulusoy, et al. 2014) can be realised with new pedagogical approaches. The fact that teachers working in BİLSEMs have high teaching motivation, can use digital technologies effectively, can develop materials suitable for the individual needs of students, can apply and evaluate these materials will make significant contributions to the development of talents of gifted students.

This study aims to contribute to the literature by determining the teaching motivations of BİLSEM teachers and their digital material design competences including various elements. In this direction, answers to the following questions were sought:

What are the digital material design and teaching motivation levels of teachers working in BİLSEMs?

- What are the levels of digital material design and teaching motivation?

- Do digital material design and teaching motivation levels differ according to gender and professional seniority?

- Is there a relationship between teaching motivation and digital material design competences?

- What is the relationship between digital material design and motivation levels in the school where they work?

METHOD

In this study, mixed research method was used in which qualitative and quantitative data were used together and which provided a better understanding of the research problems (Creswell, 2012). The embedded design, which is one of the mixed research models, in which quantitative data are supported by qualitative data, was preferred (Creswell & Plano-Clark, 2007). In the quantitative dimension of the study, the relational screening model was used. Survey models include studies conducted to determine the characteristics of a specific group (Büyüköztürk et al., 2012). In the qualitative dimension of the research, data were collected using a semi-structured interview form to support the quantitative data. In the qualitative part of the study, "Case Study", which is one of the qualitative research methods, was preferred to reveal the views of BİLSEM teachers on digital material design.

Case studies are in-depth researches in which individuals, events and processes are handled as a whole, using multiple data collection sources (interviews, observations, documents, reports) in a certain period of time (Creswell & Plano-Clark, 2007; Yıldırım & Şimsek, 2011; Yin, 1984).

Data Collection Tools

Quantitative data collection tools

The population of this study consists of 4329 teachers working in BİLSEMs in Turkey. The sample of the study consists of 106 primary and secondary school teachers working in BİLSEMs in various provinces of Turkey. Of the teachers participating in the study, 39.6% (n=42) were male while 60.4% (n=64) were female. Of these teachers, 18.9% (n=20) had 0-10 years of professional experience, 45.3% (48) had 11-20 years of professional experience and 35.8% (n=38) had 21 years or more of professional experience.

In the quantitative dimension of this study, the " Teachers' Motivation for Teaching Scale" was used to determine teachers' motivation to teach and the "Digital Material Design Competencies Scale" was used to reveal their digital material design competencies. Data were collected online via Google Forms.

First research instrument; Teachers' Motivation for Teaching Scale: This scale was developed by Kauffman, Yılmaz Soylu, and Duke (2011) and adapted into Turkish by Candan and Gencel (2015). The scale, which consists of two factors, intrinsic and extrinsic motivation, has a 6-point Likert type. The reliability coefficient for the intrinsic motivation factor in the original form of the scale is Cronbach's Alpha .86, while the reliability coefficient for the other factor extrinsic motivation is .76. In this study, the reliability coefficient for intrinsic motivation dimension is Cronbach's Alpha .87 and for extrinsic motivation factor is .77. According to the arithmetic mean scores obtained from the scale, teachers' motivation levels are evaluated as "Low" between 1.00-2.49, "Moderate" between 2.50-4.49 and "Advanced" between 4.50-6.00 (Candan & Gencel, 2015).

Second research instrument; Digital Material Design Competencies Scale: The scale developed by Karaban (2020) consists of 31 items and 4 sub-factors. The sub-factors of the scale are "Design and Development Competence", "Technical Competence", "Technopedagogical Competence" and "Implementation and Evaluation Competence" and have a 5-point Likert type. In the evaluation of the data obtained from the scale, the arithmetic mean value of 31 points is calculated as the lowest score and

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155 points as the highest score. Among the sub-factors of the scale, "Design and Development Competence" is 9-20.99 Low, 21-32.99 Medium, 33-45 High, "Technical Competence" factor is 8-18.66 Low, 18.67-29.33 Medium, 29.34-40 High, "Technopedagogical" factor is 8-18.66 Low, 18. 67-29.33 Medium, 29.34-40 High in the "Technopedagogical" factor, 6-13.99 Low, 14-21.99 Medium, 22-30 High in the "Implementation and Evaluation" factor, and 31-72.33 Low, 72.34-113.66 Medium, 113.67-155 High in the scale in general. The overall reliability coefficient Cronbach's Alpha value is .98. The reliability coefficients of the sub-factors are .97 for "Design and Development Competence", .94 for "Technical Competence", .96 for "Technopedagogical Competence" and .95 for "Implementation and Evaluation Competence". In the study, Cronbach's Alpha value was obtained as .97 in the scale. The reliability coefficients of the sub-factors are .93 for "Design and Development Competence", .92 for "Technical Competence", .92 for "Technopedagogical Competence" and .92 for "Implementation and Evaluation Competence".

Qualitative data collection tools

In the qualitative dimension of the research, 12 teachers working in a BİLSEM in the Western Black Sea Region were interviewed, 7 of the participants were female and 5 were male. In the qualitative phase of the study, a semi-structured interview form was used. The themes used in the analysis phase of qualitative data were formed by taking into account the scales and sub-factors of the scales used in the quantitative dimension of the research.

The semi-structured interview questions were sent to two academics working in the field of educational sciences and two teachers working at BİLSEM to obtain expert opinions. The interview questions were rearranged with the suggestions from the experts. Attention was paid to open-ended questions in the preparation of the questions. The arranged questions are given below.

The following questions were asked to the participants in the semi-structured interview form.

1. What are your thoughts on designing and developing digital materials for gifted students?

2. Do you consider yourself technically competent in preparing digital materials? Why?

3. What can you say about your pedagogical competence for gifted students?

4. How do you perceive your ability to implement and evaluate digital materials for gifted students? Why?

5. Are you feel satisfied with working at BİLSEM? Why?

A pilot application was carried out with two teachers working at BİLSEM using the arranged questions. As a result of the pilot application, it was seen that the interview questions were understandable.

Analysis of Quantitative Data

In the analysis of the quantitative data, firstly, it was checked whether the data showed normal distribution or not. When the Kolmogorow-Smirnov test results of the data obtained from the Teachers' Digital Material Design Scale were analysed, it was seen that ($p>0.05$) and it was found that the data fit the normal distribution. When the Kolmogorow-Smirnov test results of the data obtained from the Teachers' Teaching Motivation Scale were analysed, it was seen that the Intrinsic Motivation Factor was ($p<0.048$) and did not fit the normal distribution, while the Extrinsic Motivation Factor was ($p>0.17$). When Skewness and Kurtosis values, another criterion used in deciding on normal distribution, were analysed, it was seen that Skewness=-0.624, Kurtosis=0.944 in the data of Teachers' Digital Material Design Scale, Skewness=-0.322, Kurtosis=-0.535 in the Intrinsic Motivation factor of Teachers' Teaching Motivation Scale, and Skewness=-0.197, Kurtosis=-0.500 in the Extrinsic Motivation factor. When Kurtosis and Skewness values take a value between -1.5 and +1.5, it can be accepted that the data are normally distributed (Tabachnick & Fidell, 2013). According to these results, the data were accepted to be normally distributed and analyses were made.

Analysis of Qualitative Data

The data obtained from the teachers working in BİLSEMs were analysed by descriptive analysis method. The main purpose of descriptive analysis is to reach the concepts and relationships to be used in explaining the data. A framework is created in the realisation of descriptive analysis. Data are processed, findings are defined and interpreted according to the created framework (Yıldırım & Şimşek, 2011). In the direct quotations included in the analysis, the institutions and personal information of the teachers participating in the study were kept anonymous, and the individuals were coded as P1 P2....P12.

In the study, the data obtained from the teachers through a semi-structured interview form was transferred to the Microsoft Word program and descriptive analysis was performed. The data was processed according to the thematic framework, meaningful and logical arrangements were made and the data found to be unimportant were removed from the study. In defining the data, care was taken to ensure that they were readable and understandable. Codes were created according to the determined themes and comments were made in accordance with the purpose of the study.

In order to ensure credibility in the validity phase of qualitative research, all the data obtained and the final version of the study were sent to an academic expert in the field of Educational Sciences and expert review was carried out. The data analysed in the credibility dimension were sent to the participants and participant confirmation was obtained. Credibility is one of the most important criteria of scientific research (Başkale, 2016). In the data analysis phase, direct quotations reflecting the views of the participants were used. In order to ensure maximum diversity in the teachers participating in the research, teachers from different branches were included and gender distribution was taken into consideration. In order to ensure maximum diversity in the teachers participating in the research, teachers from different fields were included and gender distribution was taken into consideration.

To ensure reliability, the interviews were recorded and then the statements in the recordings were transcribed as they were. Factors that contribute to increasing reliability are recording the data, transforming the data in a complete and error-free manner, using these data by more than one researcher (Büyüköztürk et al., 2012).

Ethic

Ethics committee permission for the study was received from Zonguldak Bülent Ecevit University Human Research Ethics Committee (Date: 28.04.2023/299828 Protocol No: 200).

FINDINGS

Findings Related to Quantitative Data

This section presents the findings obtained from quantitative data in the research

Descriptive statistics on the competency levels of academics and teachers in digital material design are given in Table 1.

Table 1. *Arithmetic means of competency levels in digital material design and teaching motivation of teachers*

Scales	Competency Category	N	X	Ss	Level
	Design and Development	106	32.83	7.21	Medium
Digital Material	Technical Competency	106	31.59	5.81	High
Design Competency	Technopedagogical	106	31.82	5.39	High
	Implementation and Evaluation	106	24.35	4.25	High
	Total (General)	106	120.60	20.51	High
	Intrinsic Motivation	106	27.87	7.92	Medium
Teaching Motivation	Extrinsic Motivation	106	16.25	5.30	Medium

When Table 1 is examined, it is seen that the competency level of teachers in digital material design across the scale ($\overline{X}$=120.60) is rated as "High" with the arithmetic mean, "Design and Development" sub-factor ($\overline{X}$=32.83) is rated as "Medium" with the mean, "Technical Competency" ($\overline{X}$=31.59) is rated as High, "Technopedagogical" ($\overline{X}$=31.82) is rated as High, and in the "Implementation and Evaluation" factor ($\overline{X}$=24.35) it is rated as High with the mean. It is observed that teachers have a medium level of motivation in the "Internal Motivation" factor ($\overline{X}$=27.87) and a medium level of motivation with the arithmetic mean in the "External Motivation" factor ($\overline{X}$=16.25).

The results of the t-test regarding whether there is a significant difference between the competency levels in digital material design and teaching motivation of teachers and the gender variable are given in Table 2.

Table 2. *t-Test results on the difference between gender variable and competency levels in digital material design and sub-factors as well as teaching motivation levels of teachers*

Scales	Factors	Gender	N	$\overline{X}$	Ss	Sd	t	p
	Design and Development	Male	42	33.45	6.86	104	0.71	.47
		Female	64	32.42	7.45			
Digital material Design	**Technical Competence**	Male	42	32.95	5.45	104	1.97	.04*
		Female	64	30.70	5.91			
	Technopedagogical Competency	Male	42	32.57	4.96	104	1.17	.24
		Female	64	31.32	5.55			
	Implementation and Evaluation	Male	42	24.50	4.13	104	.26	.78
		Female	64	24.26	4.36			
	Total	Male	42	124.47	19.17	104	1.17	.24
		Female	64	118.71	21.28			
Teaching Motivation	**Intrinsic Motivation**	Male	42	26.54	8.45	104	-1.06	.16
		Female	64	28.75	7.50			
	Extrinsic Motivation	Male	42	16.26	5.42	104	0.01	.99
		Female	64	16.25	5.26			

*p<.05

When Table 2 is analysed, it is seen that a significant difference between teachers' digital material design competency levels and gender variable is found only in the "Technical Competence" [t(104)=1.97, p<.05] factor, whereas in the overall scale [t(104)=1. 17, p>.05], sub-factors "Design and Development" [t(104)=0.71, p>.05], "Technopedagogical Competence" [t(104)=1.17, p>.05] and "Application and Evaluation" [t(104)=0.26, p>.05]. According to this result, it is seen that male teachers have higher levels of Technical Competence than female teachers.

The one-way analysis of variance (ANOVA) test results conducted to determine the difference between teachers' levels of digital material design competency and their professional seniority is presented in Table 3.

Table 3. *Variance analysis results on the difference between teachers' levels of digital material design competency and professional seniority*

Factor	Seniority	N	$\overline{X}$	Source of Variance	Sum of Squares	df	Mean Squares	F	p	Difference
Design	0-10 years	20	35.20	Between Groups	139.05	2	69.27	1.34	.26	---
	11-20 years	48	32.35	Within Groups	5327.89	03	51.72			
	21 and above	38	32.18	Total	5466.94	105				
Technical	0-10 years	20	31.40	Between Groups	1.27	2	.63	.01	.98	---
	11-20 years	48	31.58	Within Groups	3550.28	03	34.46			

	21 and above	38	31.71	Total	35551.55	105				
Technopedagogical	0-10 years	20	32.35	Between Groups	10.30	2	5.15	.17	.83	---
	11-20 years	48	31.52	Within Groups	2983.29	03	28.96			
	21 and above	38	31.92	Total	2993.54	105				
Implementation and Evaluation	0-10 years	20	24.95	Between Groups	16.11	2	8.05	.44	.64	---
	11-20 years	48	23.95	Within Groups	1888.26	03	18.33			
	21 and above	38	24.55	Total	1904.37	105				
Total	0-10 years	20	123.90	Between Groups	287.05	2	143.52	33	.71	---
	11-20 years	48	119.41	Within Groups	43912.30	03	426.33			
	21 and above	38	120.36	Total	44199.35	105				

When Table 3 is analysed, no significant difference [F(2,105) = .33, p>.05] was found between the professional seniority of the SAC teachers and their digital material design competency levels. Similarly, no significant difference was found in the sub-factors "Design and Development" [F(2,105) = .01, p>.05], "Technical Competence" [F(2,105) = .17, p>.05], "Technopedagogical Competence" [F(2,105) = .17, p>.05] and " Implementation Competence" [F(2,105) = .44, p>.05].

The results of the one-way analysis of variance (ANOVA) test conducted to determine the difference between BILSEM teachers' teaching motivation levels and professional seniority are presented in Table 4.

Table 4. *Variance analysis results on the difference between teachers' levels of ıntrinsic and extrinsic motivation and professional seniority*

Factor	Seniority	N	$\overline{X}$	Source of Variance	Sum of Squares	sd	Mean Squares	F	p	Difference
Intrinsic Motivation	0-10 years	20	29.65	Between Groups	187.57	2	93.75	1.50	.22	---
	11-20 years	48	26.45	Within Groups	6407.83	03	62.21			
	21 and above	38	28.73	Total	6595.40	105				
Extrinsic Motivation	0-10 years	20	17.60	Between Groups	49.13	2	24.56	.87	.42	---
	11-20 years	48	16.14	Within Groups	2906.99	03	28.23			
	21 and above	38	15.68	Total	2956.2	105				

When Table 4 is examined, no significant difference was found between the professional seniority of BİLSEM teachers and the factors of "Intrinsic Motivation" [F(2,105) = 1.50, p>.05] and "Extrinsic Motivation" [F(2,105) = 0.42, p>.05].

In order to determine the relationship between the digital material design competencies and sub-factors of BİLSEM teachers and their teaching motivation levels (intrinsic-extrinsic), Pearson Correlation Coefficients analysis results are provided in Table 4. When interpreting the correlation values between factors, it is considered high if the absolute value is between 0.70-1.00, moderate if between 0.70-0.30, and low if between 0.30-0.00 (Büyüköztürk et al., 2012).

Table 5. *Correlation coefficient results between teachers' digital material design competences and sub-factors and their motivation to teach (intrinsic-extrinsic) levels*

Scale/Scale Sub-Dimension	1	2	3	4	5	6	7
Design and Development	1.00						
Technical	.722**	1.00					
Technopedagogical	.804**	.844**	1.00				
Implementation and Evaluation	.647**	.723**	.795**	1.00			
Design (General)	.906**	.914**	.947**	.847**	1.00		
Intrinsic Motivation	.392**	.174	.316**	.341**	.340**	1.00	
Extrinsic Motivation	.408**	.193*	.326**	.286**	.342**	.727**	1.00

** p<.01

When Table 5 is analysed, it is seen that there is a "High" level positive relationship between the digital material design competencies of BILSEM teachers and their sub-factors "Design Competence" level (r=.906, p<.05), "Technical Competence" (r=.914, p<.05), "Technopedagogical Competence" (r=.947, p<.05) and "Application Competence" level. It is seen that there is a positive "High" level relationship between "Intrinsic Motivation" and "Extrinsic Motivation" levels of BILSEM teachers (r=.727, p<.05).

Furthermore, there is a positive "Moderate" level correlation between BILSEM teachers' external motivations and digital material design competencies (r=.342, p<.05), a "Moderate" level correlation between the sub-factor "Design Competency" level (r=.408, p<.05), a positive "Low" level correlation with "Technical Competency" (r=.193, p<.05), a "Moderate" level correlation with "Technopedagogical Competency" (r=.326, p<.05), and a positive "Moderate" level correlation with "Implementation and Evaluation" level (r=.286, p<.05).

Moreover, there is a positive "Moderate" level correlation between BILSEM teachers' intrinsic motivations and digital material design competencies (r=.340, p<.05), a "Moderate" level correlation with the sub-factor "Design Competency" level (r=.392, p<.05), a positive "Moderate" level correlation with "Technopedagogical Competency" (r=.316, p<.05), and a positive "Moderate" level correlation with "Implementation and Evaluation" level (r=.341, p<.05). No significant relationship was found between intrinsic motivation and "Technical" competency (r=.174, p>.05).

Lastly, a positive "High" level relationship is observed between BILSEM teachers' intrinsic motivations and extrinsic motivation levels (r=.727, p<.05).

Findings Related to Qualitative Data

In this section, findings related to each qualitative research question are presented.

What are your thoughts on designing and developing digital materials for gifted students?

The teachers who participated in the research stated that each gifted student has different learning styles, that it is difficult and time consuming to prepare materials for each student, and that they need professional development programmes for innovative implementations such as augmented reality, virtual reality and artificial intelligence.

The opinions of some teachers on this subject are as follows. *Each of the gifted students has different learning styles. Therefore, preparing personalised materials for these students is the most difficult issue for me (P4). New digital materials are constantly coming out, I have to follow them. I feel the need to constantly improve myself (P8). On the other hand, it takes a lot of time to prepare digital materials (P2).*

Do you consider yourself technically competent in preparing digital materials? Why?

Among the teachers who participated in the study, there were five teachers who considered themselves technically competent in preparing digital materials (P1, P3, P4, P9, P11), six teachers who considered themselves partially competent (P2, P6, P7, P8, P10, P12), and one teacher who considered herself/himself inadequate (P5).

The opinions of some teachers who consider themselves competent in preparing digital materials are as follows. ...... *I can create interactive materials, simulations, special applications and online content in accordance with the needs of students. In addition, I try to observe technical standards such as accessibility, usability and interactivity when designing digital materials (P4). ...... So far, I have had the opportunity to analyse a lot of materials and materials. Knowing what will be useful for students, I can make designs for them (P9) I can easily apply these designs in my classroom. But I still feel a great hunger for learning (P11).*

The opinions of the teachers who consider themselves partially technically competent in preparing digital materials are as follows

...I consider myself partially competent. Digital material development or design is a very wide field. New tools come out every day. I try to improve myself by feeding myself from various sources in line with my needs (P10) There are many ready-to-use educational digital materials on my subject. Therefore, I prefer ready-made and existing educational digital materials, especially augmented reality or artificial intelligence applications. Preparing these requires a separate software, it is very difficult to master all of them, but I prefer them because it is easy, practical and useful to prepare digital materials with Web2.0 tools (P8, P12). For example, I would like to make a mobile application related to my branch, but I do not have enough knowledge on this subject (P12). We need trainings for digital material design (P5), software, hardware and licensed programmes (P9).

What can you say about your pedagogical competence for gifted students?

While nine of the teachers who participated in the study stated that they were pedagogically adequate about gifted students (P1, P2, P3, P4, P5, P6, P8, P10, P11), two teachers (P7, P12) stated that they were partially adequate and one teacher stated that he/she was inadequate (P9). They stated that the reason why they considered themselves sufficient was that they had teaching experience, they had taught gifted students in their classes in the schools where they worked before BİLSEM, and they had participated in professional development programmes for these students. The opinions of some teachers on this subject are as follows.

.... I can use pedagogical methods (P3, P4) thanks to my experience of working with gifted students and my constantly updated knowledge in this field. I participate in seminars and trainings organised for these students (P2, P8, P10, P11). I can make my lessons more fun (P5). There were gifted students in the regular schools I have worked in until today, I think that I have gained experience in terms of working years and that we have done good pedagogical work with these students (P6).

The teachers who stated that they were partly competent explained the reason as follows

...... I was very anxious before I started working at BİLSEM. I still am. I think I need to add a lot to them (P7). In order to be sufficient for these students, I try to follow those who do different studies, follow relevant books and social media accounts (P12).

How do you perceive your ability to implement and evaluate digital materials for gifted students? Why?

While some of the BİLSEM teachers (P1, P2, P4, P7, P8, P10, P11) considered themselves sufficient, some of them (P3, P6) considered themselves partly sufficient, and some of them (P5, P9, P12) considered themselves insufficient in terms of having students practise and evaluate using digital materials. Eachers who applied and assessed students using digital materials stated that digital materials are useful in concretising abstract concepts, providing permanent learning and interaction. The opinions of some teachers on this subject are as follows.

...... I use the digital tools I have developed in process evaluation and identifying student needs. These tools guide me in communicating and collaborating with students (P4). We make students find the abstract mathematical rules by proving them with design geometry, in the same way, the proofs we make using the Geogebra programme enable students to learn the subjects more permanently (P8). The WEB 2.0 tools that I use as digital materials are tools that contribute to active, interactive and permanent learning (P10)

The comments of some teachers who felt themselves inadequate in the dimension of implementation and evaluation of digital materials are as follows.

........, the application and evaluation of digital materials is a very wide area and I do not feel myself sufficient in the field (P3). The practice and evaluation aspect is not for me. I stay away from it as much as possible except in compulsory situations (P9). I think that they should learn by doing and experiencing

rather than digital materials (P5).

Are you feel satisfied with working at BİLSEM? Why?

When the teachers who attended the study were asked the question "Do you feel satisfied working at BILSEM? Why?", some teachers stated that they were happy to work with gifted students and that there were factors that positively affected their motivation (P1, P3, P4, P5, P6, P7, P8, P9, P11), while others (P6, P7, P8, P9, P10) repeeted that their motivation decreased.

Some of the teachers who stated that they were happy to work at BİLSEM explained the reasons for this as follows.

.... I can say that working with gifted students is a passion and privilege for me. Their unique talents, creativity and curiosity are my biggest source of motivation. It is a great pleasure for me to work with them (P4, P7), it is very nice for them to put their dreams into practice by using their imagination (P5), it is an enjoyable job (P6). Working on different subjects and producing something without the rush of curriculum training (P7) prevents me from getting rusty, my mind is constantly busy to produce something new (P11). The perception, preparedness and reasoning levels of the students who come here are quite high. This situation relaxes us. It also gives us the opportunity to improve ourselves and enrich our activities (P12).

Some of the teachers participating in the research (P6, P7, P8, P9, P10) stated that working at BİLSEM causes loss of motivation, that students are sometimes reluctant to come to a second school when they leave their schools, and that their lack of attendance decreases their motivation. Teachers stated that BİLSEM's working schedule is out of normal working hours and some administrators' attitudes cause their motivation to decrease. Some teacher opinions on this matter are as follows.

.... students leave school and come to BİLSEM reluctantly and tiredly. Therefore, the reluctance of the student causes us to lose motivation (P6). Another reason for the loss of motivation is due to the BILSEM system (P10), working hours makes our family life difficult and conflicts with it (P12). Administrator attitudes also affect us negatively from time to time (P9).

DISCUSSION, CONCLUSION, RECOMMENDATIONS

In this study, it was tried to reveal the relationship between the digital material design and development competences of teachers working in BİLSEMs and their teaching motivation. The quantitative and qualitative data collected in the study were analysed and interpreted together.

What are the digital material design and teaching motivation levels of teachers working in BİLSEMs?

According to the quantitative data of the study, it was concluded that BİLSEM teachers considered themselves "Highly" competent in the overall Digital Material Design Scale and its sub-dimensions of Technical, Technopedagogical, Implementation and Evaluation dimensions, and "Moderately" competent in the Digital Material Design and Development sub-dimension. Gökbulut, Keserci and Akyüz (2021), in their study conducted for academicians, found that they had high level competencies in the overall digital material design scale and its sub-dimensions of Technical, Technopedagogical, Implementation and Evaluation dimensions. Kılıç and Özkan (2022) found that BİLSEM teachers consider themselves competent above average in designing and developing learning environments and evaluation activities suitable for the digital age. In the same study, it was concluded that educational technology standards and self-efficacy perceptions were at a high level, supporting the research finding. It is determined that BİLSEM teachers use WEB 2.0 tools intensively and their competences in this regard are high (Kıroğlu & Güven, 2024). Altındiş (2016) states that BİLSEM teachers have high technology integration self-efficacy. Türksoy and Karabulut (2020) stated that BİLSEM teachers are willing to use augmented reality and virtual reality applications in education, but they have prejudices against preparing

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materials in this field, and Eker (2019) stated that they do not have information about how to perform technology integration. BİLSEM teachers need training on the integration of design, modelling, web content development, robotics and STEM education (Çalışkan, 2017).

In the qualitative interviews conducted with teachers in the study, they stated that each gifted student has different learning styles, that it is difficult and time-consuming to prepare materials for each student, and that they need professional development programmes in these areas in order to develop innovative applications such as augmented reality, virtual reality and artificial intelligence. Altun and Vural (2012) stated that in-service training activities for BİLSEM teachers were not sufficient, and that a limited number of teachers participated in the trainings organised so far and that they were inefficient. In their study, Öğülmüş and Sarı (2014) stated that BİLSEM teachers were inadequate in trainings due to lack of materials and they could not meet the educational needs of students.

It was concluded that BİLSEM teachers had "moderate" level of motivation in the Intrinsic Motivation and Extrinsic Motivation dimensions of the motivation scale for teaching. In the literature, in parallel with the research finding, it is frequently encountered in quantitative studies conducted with teachers working in schools other than BİLSEM that intrinsic and extrinsic motivation is at a moderate level (Çelik, 2022; Gökbulut, 2023; Gün & Turabik, 2019; Kütükcü, 2020; Oran, Güler & Bilir, 2016). In the qualitative interviews conducted in order to reveal the reasons why BİLSEM teachers defined their intrinsic-extrinsic motivation as medium level in the quantitative dimension of the research, teachers stated the issues that negatively affected their motivation as follows. The students come to BİLSEM from compulsory education and they are sometimes reluctant to come to a second school. Besides this, the problems of the absence of students, the working hours of BİLSEM, the attitudes of the administrators negatively affected their motivation. While students continue formal education (preparation for central exams, study centre, and private lessons), coming to BİLSEM puts students in an intense tempo and sometimes they are absent to do their homework and lessons. These factors negatively affect the extrinsic motivation of teachers (Eker, 2019; Kazu & Şenol, 2012; Öğülmüş & Sarı, 2014; Kurtdaş, 2012; Özkan, 2009). Another factor that negatively affects the motivation of BİLSEM teachers is the insufficiency of professional development opportunities offered by both the Ministry of National Education and the institution (Altun & Vural, 2012). BİLSEM teachers feel themselves inadequate in terms of appropriate pedagogical methods to know gifted students in mental, social and emotional dimensions and to provide education for their needs (Topcu, 2022). BİLSEM teachers need to increase their motivation and support their personal development (Altun & Vural, 2012).

When the quantitative and qualitative data of the study are analysed together, it is seen that BİLSEM teachers are willing to prepare and use digital materials in trainings and use WEB 2.0 tools in their trainings. Although they are willing to prepare and use materials, we can say that they feel inadequate about augmented reality, virtual reality, artificial intelligence applications and they need professional development programmes on these issues. We can say that teachers' intrinsic motivation to work in BİLSEM is at a good level, while extrinsic motivation sources cause motivation losses. On the basis of the loss of extrinsic motivation, it has been observed that students come to BİLSEMs tired, reluctant and absenteeism after formal education.

Do the digital material design and teaching motivation levels of teachers working in BİLSEMs differ according to their gender and professional seniority?

While there was no significant difference between the Digital Material Design (General) and the scale sub-factors Design and Development, Technopedagogical, Implementation and Evaluation dimensions of the teachers working in BİLSEMs and the gender variable, a significant difference was found in the Technical Competence sub-factor. According to these results, we can say that there is no difference between male and female teachers in Digital Material Design (General) and scale sub-factors, Design and Development, Technopedagogical, Application and Evaluation dimensions. In the technical

level of digital material design, we can conclude that male teachers have higher competences than female teachers. Kılıç and Özkan (2022) found no significant difference between BİLSEM teachers' self-efficacy towards educational technology standards and gender in their study. In the same study, similarly, no significant difference was found between the gender variable in designing and developing learning environments and assessment activities for the digital age. In their study, Gökbulut et al. (2021) obtained a result in favour of male academicians in the overall digital material design scale and its sub-dimensions, Technical, Technopedagogical dimensions, while no significant difference was found between male and female academicians in the Implementation and Evaluation dimension in support of the research finding. In the same study performe with teachers, no significant difference was found between male and female teachers in the overall digital material design scale and Implementation and Evaluation, Technopedagogical, Design and Development sub-factors, while a meaningful difference was found in favour of male teachers in the Technical Competence sub-factor. When the qualitative dimension of the research was analysed, more than half of the teachers stated that they were partly sufficient or insufficient in the technical dimension of preparing digital materials. They stated that they were inadequate especially in current issues such as augmented reality, virtual reality and artificial intelligence applications, and for this reason, they preferred WEB.2.0 tools which are easy to prepare digital materials. In-service trainings for BİLSEM teachers are not at an adequate level and teachers need to attend these trainings regularly for their professional development (Akhan & Altaş, 2021; Satmaz & Gencel, 2016; Semerci & Kaya, 2007; Sezginsoy, 2007; Özkan, 2009).

In the study, no significant difference was found between the sub-factors of the teaching motivation scale of BİLSEM teachers, Intrinsic Motivation and Extrinsic Motivation factors and gender variable. According to this result, it can be said that there is no difference between the intrinsic and extrinsic motivation of male and female teachers working in BİLSEM and that motivation sources do not create a difference on male and female teachers depending on gender. In the literature, there are no quantitative studies investigating the difference between the intrinsic-extrinsic motivation of BİLSEM teachers and the gender variable, however, studies on teachers working at other education institutions are frequently available. Among these studies, there is no significant difference between extrinsic motivation of teachers and gender variable (Ertürk, 2014; Gökbulut, 2023) in the direction of supporting the research finding, as well as studies in which intrinsic motivation of female teachers is high (Al-Salameh, 2014; Çiçek, 2009; Emiroğlu, 2017; Gökbulut, 2023; Kaya, Yıldız & Yıldız, 2013; Kılıç, 2019). The reason why different results were obtained between the motivation and gender variable in the studies conducted for teachers working in BİLSEMs and teachers working in other educational institutions may be due to the fact that BİLSEM teachers work in these schools after passing a several-stage examination and that it's their choice to work there.

No significant difference was found between digital material design (General) and scale sub-factors Design and Development, Technical, Technopedagogical, Technopedagogical, Implementation and Evaluation dimensions of teachers working in BİLSEMs and professional seniority variable. According to this result, we can say that teachers' working year is not effective in designing digital materials. Similarly, no significant difference was found between teachers' intrinsic and extrinsic motivation levels and professional seniority variable. According to this result, we can say that professional seniority has no effect on the intrinsic and extrinsic motivation levels of BİLSEM teachers. Since they are selected to these schools through written and oral exams, have the desire and motivation to work voluntarily in these schools, and are experienced in project-based learning, so professional seniority may not have an effect. As a result of the qualitative interviews with the teachers, they stated that the majority of them were happy to work in BİLSEM, that they did not have much difficulty after becoming a teacher in these schools, and that the reason for this was that they had teaching experience before starting to work in BİLSEM, that there were gifted students in their classes in the schools they worked before and that they had participated in professional development programmes for gifted students. Sezginsoy (2007) reported that although the working periods of the teachers in BİLSEM were different, their opinions about the education and training

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situations were similar. In their study, Kazu and Şenol (2012) stated that teachers with less professional seniority enabled students to use technology more, while Özkan (2009) pointed out that as the professional seniority of BİLSEM teachers increased, their negative opinions about the institution also increased. Altındiş (2022), in his metaphor study on BİLSEM teachers' views on distance education, states that teachers with high professional seniority develop fewer metaphors and that these metaphors are negative ones. Gökbulut et al. (2021) found no significant difference between the overall scale and its sub-factors and the variable of professional seniority in support of the research finding in their study with academicians, while in their study with teachers, they found that the digital material design competencies of teachers with less professional seniority were higher than those of teachers with more professional seniority.

Is there a relationship between teaching motivation and digital material design competences of teachers working in BİLSEMs?

In the study, it was observed that there was a "High" level relationship between BİLSEM teachers' digital material design (General) and scale sub-factors Design and Development, Technical, Technopedagogical, Implementation and Evaluation aspects. According to this result, we can say that teachers should have the same level of competence in the dimensions of Design and Development, Technical, Technopedagogical, Implementation and Evaluation. The factor with the lowest correlation between the overall scale and its sub-factors is the "Technical" factor. In the qualitative interviews with the teachers, they stated that they had the most difficulties in the technical parts of preparing digital materials and that they needed to participate in professional development programmes on these issues. It is stated that the reason for the low self-efficacy of teachers working in BİLSEM is due to their concerns about technology (Kılıç & Özkan, 2022).

In the study, it was seen that there was a "High" level relationship between intrinsic motivation and extrinsic motivation of BİLSEM teachers. According to this result, we can say that extrinsic motivation sources can affect BİLSEM teachers' willingness to work in BİLSEM, which is an intrinsic motivation source. When the qualitative data obtained in the study were evaluated, it was concluded that the teachers were happy to work in BİLSEM and to be with gifted students in a way that supports the quantitative finding. The fact that teachers want to work in BİLSEM is an indication that their intrinsic motivation is high. Communication with colleagues, attitudes and behaviours of school administrators are among the factors affecting extrinsic motivation of teachers. Teachers and administrators working in BİLSEMs are also assigned to these schools according to certain criteria and in line with their wishes. Communication and collaboration between teachers who have the same intrinsic motivation to teach gifted students is likely to positively affect their extrinsic motivation. Similarly, high intrinsic motivation of school administrators appointed to BİLSEM will positively affect the extrinsic motivation of teachers. This may have been effective in the high correlation between teachers' intrinsic and extrinsic motivation. Kurtdaş (2012) states that students who come to BİLSEM are happy despite being in an intense schedule, and Eker (2019) reports that students' self-confidence and motivation increase with the education they receive at BİLSEM and that they have fun at the same time. Similarly, Akhan and Altaş (2021) stated that teachers are happy to work in BİLSEM, their professional satisfaction and job satisfaction are high, and they feel themselves autonomous (Topcu, 2022).

In the study, a "Moderate" level relationship was found between the intrinsic motivation of BİLSEM teachers and Digital Material Design (General) and scale sub-factors Design and Development, Technopedagogical, Implementation and Evaluation dimensions. No significant relationship was found between intrinsic motivation and technical competence. According to this result, we can say that as teachers' intrinsic motivation increases, their willingness to design digital materials will increase or vice versa, as their intrinsic motivation decreases, their willingness to prepare digital materials will decrease. We can state that the reason why there is no correlation between teachers' intrinsic motivation and technical competence levels is that teachers are eager to develop digital materials, and this does not affect

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their technical skills in digital material development positively or negatively.

Another result obtained in the study is that there is a "Medium" level relationship between the extrinsic motivation of BİLSEM teachers and Digital Material Design (General) and the scale sub-factors Design and Development, Technical, Technopedagogical, Implementation and Evaluation dimensions. According to this finding, we can state that as the extrinsic motivation of teachers increases, their willingness to design digital materials will increase, and vice versa, when their extrinsic motivation decreases, their willingness to design digital materials will decrease. Directing and participating in professional development programmes on digital material design may be effective in increasing the extrinsic motivation of teachers. Teachers working in BİLSEM need in-service (Satmaz & Gencel, 2016) or pre-service training to meet the needs of students, to use technological equipment at a high level, and to improve their qualifications (Kayaalp et al., 2022; Kontaş & Yağcı, 2016).

Recommendations

When the researches on BİLSEMs are analysed, it is seen that there are mainly studies that include teachers' opinions. In this study, a mixed design with qualitative and quantitative data for BİLSEM teachers was used. Similar studies can also be done for BİLSEM students and parents.

Professional development programmes on digital material design for BİLSEM teachers can be organised, and experimental studies related to trainings can be carried out.

Students receiving education in BİLSEMs are gifted and the characteristics of each of them may differ from other students. In the study, teachers reported that they had difficulty in developing personalised materials. They also stated that they need professional development programmes especially on innovative applications such as augmented reality, virtual reality and artificial intelligence. In-service training courses can be organised in these areas.

In the research, the design competences of male teachers in the technical dimension of digital material design were higher than female teachers. In-service trainings can be given to female teachers in the technical level of digital material design.

Among the factors that negatively affect the motivation of BİLSEM teachers, it was stated that students are reluctant to come to BİLSEM after schools, because this can sometimes be extremely tiring for students. Bilsem working programmes (in terms of days and hours) can be rearranged in cooperation with formal education institutions.

In the quantitative dimension of the study, although the teachers stated that they had a high level of competence in the application and evaluation of digital materials, it was seen in the qualitative interviews that their knowledge about application and evaluation was limited. In-service training programmes can be organised for teachers, especially for the use of digital materials for application and evaluation purposes.

In the quantitative stage of the research, it was obtained that the technopedagogical competences of the teachers were high, and similarly, in the qualitative interviews, the majority of the participants in the research stated that their pedagogical competences were high in teaching gifted students. However, it was observed that they had limited knowledge about technopedagogical competences. In-service trainings on technopedagogical education can be organised for BİLSEM teachers.

REFERENCES

Ada, Ş., Durdağı, A., Ayık, A., Yıldırım, İ., & Yalçın, S. (2013). Öğretmenlerin motivasyon etkenleri. *Atatürk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 17*(3), 151-166.

Akhan, O., & Altaş, S. (2021). BİLSEM tarih öğretmenlerinin BİLSEM çalışma koşulları hakkındaki görüşleri. *Manisa Celal Bayar Üniversitesi Eğitim Fakültesi Dergisi, 9*(1), 133-147. http://doi.org/10.52826/mcbuefd.924337

Al-Salameh, E. M. J. (2014). Teacher motivation: A study of work motivation of the primary stage teachers in Jordan. American Journal of Applied Psychology, 3(3), 57-61. http://doi.org/10.11648/j.ajap.20140303.12

Altındiş, Z. T. (2016). BİLSEM Öğretmenlerinin uzaktan eğitim sürecine yönelik metaforik algıları. *Turkish Academic Research Review, 7*(3), 576-603. http://doi.org/10.30622/tarr.1103831

Altun, T., & Vural, S. (2012). Bilim ve sanat merkezinde (BİLSEM) görev yapan öğretmen ve yöneticilerin mesleki gelişim ve okul gelişimine yönelik görüşlerinin değerlendirilmesi. *Elektronik Sosyal Bilimler Dergisi, 11*(42), 152-177.

Arslantaş, H. İ., Tösten, R., & Beştaş Marakçı, D. (2018). Lise öğretmenlerinde mesleki motivasyon unsurları: Karma yöntemi bir çalışma. *Mersin Üniversitesi Eğitim Fakültesi Dergisi, 14*(33), 880-895. http://doi.org/10.17860/mersinefd.485161

Başkale, H. (2016). Nitel araştırmalarda geçerlik, güvenirlik ve örneklem büyüklüğünün belirlenmesi. *Dokuz Eylül Üniversitesi Hemşirelik Fakültesi Elektronik Dergisi, 9*(1), 23-28.

Bilgiç, N., Taştan, A. Kurulukaya, G., Kaya, K., Avanoğlu, O. &, Toplal, T. (2013). Özel yetenekli bireylerin eğitimi strateji ve uygulama kılavuzu. Milli Eğitim Bakanlığı Özel Eğitim ve Rehberlik Hizmetleri Genel Müdürlüğü. https://orgm.meb.gov.tr/meb_iys_dosyalar/2013_11/25034903_zelyeteneklibireylerineitimistratejiveuygulamaklavuzu.pdf

Büyüköztürk, Ş., Akgün, Ö.E., Demirel, F., Karadeniz, Ş. & Kılıç Çakmak, E. (2012). Bilimsel araştırma yöntemleri (Geliştirilmiş 12. Baskı). Pegem Akademi: Ankara

Candan, D. G., & Gencel, İ. E. (2015). Öğretme motivasyonu ölçeği'ni Türkçe'ye uyarlama çalışması. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi, 1*(36), 72-89.

Candan, D. G. (2019). Okul öncesi öğretmen adaylarının eğitiminde öğrenme yörüngeleri modeli ile bir program geliştirme uygulaması (Yayınlanmamış yüksek lisans tezi). Çanakkale Onsekiz Mart Üniversitesi, Çanakkale.

Creswell, J. W. (2012). Educational research: Planning, conducting, and evaluating quantitative and qualitative research (4th ed.). Baston: Pearson

Creswell, J. W., & Plano-Clark, V. L. (2007). Designing and conducting mixed methods research (1. Press). London: Sage Publications Ltd.

Çalışkan, E. (2017). Özel yetenekli öğrencilerin eğitiminde bilişim teknolojilerinin kullanımına yönelik öğretmen görüşlerinin incelenmesi. *Gazi Üniversitesi Gazi Eğitim Fakültesi Dergisi, 37*(3), 811-833. http://doi.org/10.17152/gefad.330149

Çelik, B. N. (2022). Teknostresin Öğretmenlerin Öğretme Motivasyonu ve Mutluluk Düzeylerine Etkisi (Yayınlanmamış yüksek lisans tezi). Zonguldak Bülent Ecevit Üniversitesi, Zonguldak.

Çiçek, Ö. (2009). Sınıf öğretmenlerinin motivasyon kaynakları (Yayınlanmamış yüksek lisans tezi). Beykent Üniversitesi, İstanbul.

Eker, M. (2019). Bilim sanat merkezlerinde görev yapan öğretmenlerin bilim, teknoloji, mühendislik ve matematik eğitimi algıları (Yayınlanmamış yüksek lisans tezi). Pamukkale Üniversitesi, Denizli.

Emiroğlu, O. (2017). Öğretmen motivasyon kaynaklarına ilişkin okul yöneticisi ve öğretmen görüşleri. (Yayınlanmamış doktora tezi). Yakın Doğu Üniversitesi, Lefkoşa-Kıbrıs.

Ertürk, R., & Türkan, A. (2013). İlköğretim okulu öğretmenlerinin içsel motivasyonları ve örgütsel kimliğe yönelik algıları. *Kuram ve Uygulamada Eğitim Yönetimi Dergisi, 19*(2), 159-179.

ElSayary, A. (2023). The impact of a professional upskilling training programme on developing teachers' digital competence. *Journal of Computer Assisted Learning, 39*(4), 1154-1166. http://doi.org/10.1111/jcal.12788

Genç, N. (2012). Yönetim ve organizasyon: çağdaş sistemler ve yaklaşımlar, Seçkin Yayıncılık, Ankara.

Gellerstedt, M., Babaheidari, S. M., & Svensson, L. (2018). A first step towards a model for teachers' adoption of ICT pedagogy in schools. *Heliyon, 4*(9). http://doi.org/10.1016/j.heliyon.2018.e0078

Göksu-Yüreğilli, D., (2021). Bilim sanat merkezlerinde eğitim öğretim. M. S. Köksal & R. Barın (Ed.), Özel yetenek ve BİLSEM'ler içinde (s. 188-212). Özel Eğitim ve Rehberlik Hizmetleri Genel Müdürlüğü.

Gökbulut, B., Keserci, G., & Akyüz, A. (2021). Eğitim fakültesinde görev yapan akademisyen ve öğretmenlerin dijital materyal tasarım yeterlikleri. *Journal of Social Sciences and Education, 4*(1), 11-24. DOI: 10.53047/josse.917536.

Gökbulut, F. (2023). Öğretmenlerin dijital tükenmişlik düzeyleri ile öğretme motivasyonu arasındaki ilişkinin incelenmesi (Yayınlanmamış yüksek lisans tezi). Zonguldak Bülent Ecevit Üniversitesi.

Gün, F., & Turabik, T. (2019). Öğretmen adaylarının olası benliklerinin öğretme motivasyonları üzerindeki etkisi. *Cumhuriyet Uluslararası Eğitim Dergisi, 8*(1), 214-234. http://doi.org/10.30703/cije.468371

Gürler, B. G., Şahin, A., & Akdal, D. (2023). Özel yetenekli öğrencilerin belirlenmesi amacıyla öğretmenlere verilen eğitimin öğretmenlerin bilgi düzeylerine etkisi. *Gazi Eğitim Bilimleri Dergisi, 9*(3), 273-293. http://doi.org/10.30855/gjes.2023.09.03.002

Kanlı, E. (2021a). Mitler ve özel yetenek. M. S. Köksal & R. Barın (Ed.), Özel yetenek ve BİLSEM'ler içinde (s. 44-47). Özel Eğitim ve Rehberlik Hizmetleri Genel Müdürlüğü.

Kanlı, E. (2021b). Özel yetenekli bireylerin özellikleri. M. S. Köksal & R. Barın (Ed.), Özel yetenek ve BİLSEM'ler içinde (s. 51-64). Özel Eğitim ve Rehberlik Hizmetleri Genel Müdürlüğü.

Karaban, G. G. (2020). Dijital materyal tasarımına yönelik bir hizmet içi eğitim programının geliştirilmesi ve etkililiğinin değerlendirilmesi (Yayınlanmamış doktora tezi). Muğla Sıtkı Kocaman Üniversitesi, Muğla.

Kauffman, D. F., Yılmaz-Soylu, M., & Duke, B. (2011). Öğretme motivasyonu ölçeğinin geçerlik çalışması. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 40*(40), 279-290.

Kaya, F. Ş., Yıldız, B., & Yıldız, H. (2013). Herzberg'in çift faktör kuramı açısından ilköğretim I. kademe öğretmenlerinin motivasyon düzeylerinin değerlendirilmesi. *Akademik Bakış Uluslararası Hakemli Sosyal Bilimler Dergisi*, (39), 1-18.

Kayaalp, F., Gökbulut, B., Meral, E., & Namlı, Z. B. (2022). The effect of digital material preparation training on technological pedagogical content knowledge self-confidence of pre-service social studies teachers. *Journal of Theoretical Educational Science*, 15(3), 475-503.

Kazu, İ. Y., & Şenol, C. (2012). Üstün yetenekliler eğitim programlarına ilişkin öğretmen görüşleri (Bilsem Örneği). *E-Uluslararası Eğitim Araştırmaları Dergisi, 3*(2), 13-35.

Kılıç, Y. (2019). Okul yöneticilerinin kişisel inisiyatif alma ve sergiledikleri liderlik davranışlarının öğretmen motivasyonuna etkisi (Yayınlanmamış doktora tezi). Selçuk Üniversitesi, Konya.

Kılıç, Ş., & Özkan, T. K. (2022). BİLSEM öğretmenlerinin eğitim teknolojisi öz yeterliği üzerine bir çalışma. *Uluslararası Eğitim Bilim ve Teknoloji Dergisi, 8*(3), 165-190. http://doi.org/10.47714/uebt.1173885

Kıroğlu, E. S., & Güven, U. (2024). BİLSEM öğretmenlerinin WEB 2.0 araçlarıyla ilgili görüşlerinin incelenmesi. *Bayburt Eğitim Fakültesi Dergisi, 19*(41), 1803-1826. http://doi.org/10.35675/befdergi.1239568

Koehler, M. J. & Mishra, P. (2006). What happens when teachers design educational technology? the development of technological pedagogical content knowledge. *Journal of Educational Computing Research, 32*(2), 131-152.

Kontaş, H., Yağcı, E. (2016). BİLSEM öğretmenlerinin program geliştirme ihtiyaçlarına ilişkin geliştirilen programın etkililiği. *Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi, 16*(3), 902-923.

Kurt, B. (2013). İlkokul ve Ortaokul Yöneticilerinin Öğretim Liderliği Davranışlarının Öğretmen Motivasyonuna Etkisi (Yayınlanmamış yüksek lisans tezi). Marmara Üniversitesi, İstanbul.

Kurtdaş, Ç. (2012). Üstün yetenekliler ve üstün yeteneklilerin eğitiminde bilim ve sanat merkezleri (Malatya Bilim ve Sanat Merkezi Örneği). *Hikmet Yurdu, 5*(10), 151-181.

Küçük, E. (2008). İlköğretim okulları öğretmenlerinin okul yöneticilerine yönelik çağdaş denetim algıları ile mesleki motivasyon düzeyleri arasında ilişki: İstanbul ili Eyüp ilçesi örneği (Yayınlanmamış yüksek lisans tezi). Yeditepe Üniversitesi, İstanbul.

Kütükcü, G. (2020). İlköğretim kademesindeki öğretmenlerin öğretme motivasyonları ile uzaktan eğitime yönelik tutumlarının incelenmesi (Yayınlanmamış yüksek lisans tezi). Marmara Üniversitesi, İstanbul.

Köksal, M. S., (2021). Bilim sanat merkezlerinde öğretmen niteliği. M. S. Köksal & R. Barın (Ed.), Özel yetenek ve BİLSEM'ler içinde (s. 51-64). Özel Eğitim ve Rehberlik Hizmetleri Genel Müdürlüğü.

Lucas, M., Bem-Haja, P., Siddiq, F., Moreira, A., & Redecker, C. (2021). The relation between in-service teachers' digital competence and personal and contextual factors: What matters most? *Computers & Education*, 160, 104052. http://doi.org/10.1016/j.compedu.2020.104052

Neves de Jesus, S. & Conboy, J. (2001). A stress management course to prevent teacher distress. *International Journal of Educational Management, 15*(3), 131-137.

MEB (2020). Bilim ve sanat merkezleri güçleniyor. https://www.meb.gov.tr/bilim-ve-sanat-merkezleri-gucleniyor/haber/21827/tr

MEB (2023). T.C. Millî Eğitim Bakanlığı Özel Eğitim ve Rehberlik Hizmetleri Genel Müdürlüğü. Bilim ve sanat merkezlerine öğretmen seçme ve atama kılavuzu. https://orgm.meb.gov.tr/meb_iys_dosyalar/2023_01/30224858_2023_YILI_BYLSEM_OYRETMEN_SECME_VE_ATAMA_KILAVUZU.pdf

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record, 108*(6), 1017–1054.

Olpak, T. (2023). Bilim ve sanat merkezlerinde görevli öğretmenlerin dijital yeterliliklerinin incelenmesi (Yayınlanmamış yüksek lisans tezi). Balıkesir Üniversitesi, Balıkesir.

Oran, F. Ç., Güler, S. B., & Bilir, P. (2016). İş motivasyonun örgütsel bağlılığa olan etkinin incelenmesi: Sultangazi/İstanbul İlköğretim okullarında bir araştırma. *Mustafa Kemal Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 13*(35).

Öğülmüş, K., & Sarı, H. (2014). Bilim ve sanat merkezlerindeki (Bilsem) karşılaşılan sorunların öğretmen ve öğrenci görüşleri açısından değerlendirilmesi. *Uluslararası Türk Eğitim Bilimleri Dergisi, 2*(2), 254-265.

Özbay, Y. (2013). Üstün yetenekli çocuklar ve aileleri. T.C. Aile ve Sosyal Hizmetler Bakanlığı Aile ve Toplum Hizmetleri Genel Müdürlüğü. Ankara

Özkan, D. (2009). Yönetici, öğretmen, veli ve öğrenci görüşlerine göre bilim ve sanat merkezlerinin örgütsel etkinliği (Yayınlanmamış yüksek lisans tezi). Ankara Üniversitesi, Ankara.

Pettersson, F. (2018). On the issues of digital competence in educational contexts–a review of literature. *Education And Information Technologies, 23*(3), 1005-1021. http://doi.org/10.1007/s10639-017-9649-3

Semerci, N., & Kaya, E. (2007). Bilim ve Sanat Merkezlerinde (BİLSEM) görev yapan öğretmenlerin BİLSEM'e yönelik görüşleri. *Sosyal Bilimler Araştırmaları Dergisi, 2*(2), 230-242.

Satmaz, İ., & Gencel, İ. E. (2016). Bilim sanat merkezlerinde görevlendirilen öğretmenlerin hizmet içi eğitim sorunu. *Dokuz Eylül Üniversitesi Buca Eğitim Fakültesi Dergisi*, (42), 59-73.

Sezginsoy, B. (2007). Bilim ve sanat merkezi uygulamasının değerlendirilmesi (Yayınlanmamış yüksek lisans tezi). Balıkesir Üniversitesi, Balıkesir.

Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher, 15*(2), 4-14.

Şahin, Ç., (2014). Bilim ve sanat merkezi öğrencilerinin bu kurumlara ilişkin görüşlerinin incelenmesi. *HAYEF Journal of Education, 11*(1), 101-117.

Şendurur, P., & Arslan, S. (2017). Eğitimde Teknoloji Entegrasyonunu Etkileyen Faktörlerdeki Değişim. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi, 43*, 25-50. http://doi.org/10.21764/efd.21927

Tabachnick, B. G. & Fidell, L. S. (2013). Using multivariate statistics. Boston: Pearson.

Topcu, S. (2022). Özel yetenekli öğrencilere eğitim veren öğretmenlerin mesleki deneyimlerinin incelenmesi: Bilsem'De Öğretmen Olmanın Anlamina ilişkin Fenomenolojik Bir Çalışma (Yayınlanmamış doktora tezi). Marmara Üniversitesi, İstanbul.

Türksoy, E., & Karabulut, R. (2020). Dijital gerçeklik teknolojilerinin Bilsem'lerde uygulanabilirliğine yönelik öğretmen görüşleri. *Nevşehir Hacı Bektaş Veli Üniversitesi SBE Dergisi, 10*(2), 436-452. http://doi.org/10.30783/nevsosbilen.657167

Ulusoy, H. F., Sakaltaş E., Güneş, H., Dokgöz, M., Akın, Ö., Köseoğlu, S., (2014). Özel yetenekli çocuklar aile kılavuzu. Milli Eğitim Bakanlığı Özel Eğitim ve Rehberlik Hizmetleri Genel Müdürlüğü. Kayseri.

Ünal, F. T., & Bursalı, H. (2013). Türkçe öğretmenlerini motivasyon faktörlerine ilişkin görüşleri. *Middle Eastern ve African Journal of Educational Research,* (5), 7-22.

Yıldız, H. (2010). Üstün yeteneklilerin eğitiminde bir model olan bilim ve sanat merkezleri (BİLSEMLER) üzerine bir araştırma (Yayınlanmamış yüksek lisans tezi). Gazi Üniversitesi, Ankara.

Yılmaz, M., & Yılmaz, T. (2021). Yönetici ve öğretmenler gözünden BİLSEM'lerde verilen eğitimin kritiği. *International Review of Economics and Management,* *9*(1), 1-27. http://doi.org/10.18825/iremjournal.828298

Yıldırım, A. & Şimşek, H. (2011). Sosyal bilimlerde nitel araştırma yöntemleri. Ankara: Seçkin Yayınevi.

Yin, R. K. (1984). Case study research: Design and methods. Newbury Park, CA: Sage.