(ISSN: 2587-0238)

Uçar, A. S. (2023). Determination of Special Education Teachers' Perceptions of Factors Making Differentiation of Instruction Difficult, *International Journal of Education Technology and Scientific Researches, 8(24), 2152-2172.*

DOI: http://dx.doi.org/10.35826/ijetsar.657

Article Type (Makale Türü): Research Article

DETERMINATION OF SPECIAL EDUCATION TEACHERS' PERCEPTIONS OF FACTORS MAKING DIFFERENTIATION OF INSTRUCTION DIFFICULT

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Received: 15.06.2023 *Accepted: 28.08.2023* *Published: 01.10.2023*

ABSTRACT

This study aimed to determine the perceptions of special education teachers regarding the factors making differentiation of instruction difficult. A total of 183 special education teachers, 117 of whom were female and 66 of whom were male, working in various provinces of Türkiye participated in the study. The study was designed with a single survey model, and data were collected with a Personal Information Form and a teacher perception inventory on Factors that Make Differentiating Instruction Difficult. As a result, it was determined that the participants perceived a moderate level of difficulty regarding the factors making differentiation of instruction difficult. In the dimension of Physical Arrangements in the classroom, female participants perceived more difficulties than male participants, and participants working at the primary school level perceived more difficulties than participants working at the high school level. In addition, participants working in special education kindergarten perceived more difficulties than participants working in special education vocational school. Participants who graduated from the Department of Special Education perceived more difficulties in the dimensions of "Harmony and Cooperation with Colleagues" and "Family and Social Environment"; however, they perceived less difficulties in the dimension of "Teacher Training". Participants who had not previously received training on differentiated instruction perceived more difficulties in the "Teacher Training" dimension than participants who had received training on this subject. It is thought that it would be useful to organize in-service trainings on differentiation of instruction for current teachers and to add courses on the subject to the undergraduate curriculum.

Keywords: Differentiated instruction, teacher, special education teacher, teacher training.

INTRODUCTION

The traditional approach to education assumed that the characteristics and needs of individuals are similar, and it was implemented in the form of imparting the knowledge determined based on the curriculum with similar methods (Rollins, 2011). However, today, the increasing importance given to individual differences causes the traditional education approach to be critically evaluated. It is thought that this system, which is designed according to average student characteristics, may be insufficient in terms of revealing the potential of students with above and below average cognitive performance and that the educational process may result in the atrophy of students (Heacox, 2002). This situation has brought individual differences to the forefront of contemporary educational approaches. Differentiated instruction, one of these approaches, has become a frequently mentioned approach, especially in the education of individuals with special needs (Singh, 2014).

Differentiated instruction is considered a philosophy for the learning and teaching process and requires addressing the individual characteristics and needs of all students as well as their interests (Fox & Hoffman, 2011; Tomlinson & Imbeau, 2010). In other words, differentiated instruction is also defined as a continuous evaluation process in which teachers make use of academic diversity in order to realize an efficient learning process (Bondie & Zusho, 2018). Contrary to popular belief, differentiated instruction is not a new concept but an approach that has been practiced since ancient times. However, the increasing importance given to individual differences has caused them to be frequently mentioned in the education system (Fox & Hoffman, 2011).

In differentiated instruction, teachers are expected to implement the principles of differentiation and the needs of students in the elements of the curriculum. The basic principles are listed as a learning environment, curriculum, assessment process, individual differences, and guidance. Students' needs are evaluated in terms of readiness, interest, and learning profile (Tomlinson & Moon, 2013; İnce vd., 2022). Differentiation in differentiated instruction can be realized as differentiation of content, process, and product. The process is based on teachers answering questions about who, what, where, and how to teach (Tomlinson & McTighe, 2006). The most important determining factor at each stage of differentiation is student characteristics (Tomlinson, 2005). The differentiation of content is related to what the teacher will teach. Teachers can increase the content according to student characteristics or limit it to basic knowledge (Rock, et al. 2008). The differentiation of the process, on the other hand, involves how the students will be taught the determined content. In addition to the time to be allocated to the learning-teaching process, the supports, and activities to be provided, and the teaching methods to be used according to student characteristics, can also be differentiated (Levy, 2008). In the process, different teaching methods can be used together, or various activities and cards can be used according to the needs (Gregory & Chapman, 2013; Roberts & Inman, 2013). The product dimension of differentiated instruction, which can also be referred to as evaluation, involves determining the extent to which students have achieved the targeted outcomes. In the evaluation process, teachers can make adaptations to the environment, duration, and instructions (Gürsel, 2008). In this process, teachers can use alternative assessment methods that are appropriate for the student (Prater, 2006).

There is a large literature on differentiated instruction. The studies frequently involve classroom teachers (Beler, 2010; Burkett, 2013; Demirkaya, 2018; Faber, Glas, & Visscher, 2018; Whipple, 2012), branch teachers (Eşiyok, 2011; Halpin-Brunt, 2007; Özer, 2016; Scott, 2012) as well as preschool teachers (Aşiroğlu, 2016; Özkanoğlu, 2015). On the other hand, only one study on differentiated instruction with special education teachers was found in the literature review (Ernest, Heckeman, Thompson, Hull & Carter, 2011). In the studies, it is frequently stated that differentiated instruction has a positive effect on students' academic achievement levels, academic motivation, and self-efficacy perceptions (Altıntaş, et al., 2013; Bal, 2016; Beler, 2010; Chamberlin & Powers, 2010; Eşiyok, 2011; Gaitas & Martins, 2017; Karakaş, 2019; Özer, 2016; Richards & Omdal, 2007; Stager, 2007; Yaprakgül, 2019). On the other hand, there are also research findings stating that differentiated instruction does not meet the needs of students at the desired level (Faber, et al. 2018). In studies conducted with classroom teachers, there are research findings stating that teachers' self-efficacy perceptions about differentiated instruction and beliefs about the level of implementation are high (Demirkaya, 2018; Halpin-Brunt, 2007; Whipple, 2012). However, it is frequently emphasized that teachers do not use differentiated instruction or use it at a limited level (Gaitas & Martins, 2017; Gray, 2008; Ismajli & Imami-Morina 2018). Teachers' perception level can be affected by their previous education, class size, and professional experience (De Neve & Devos, 2016; Joseph et al., 2013; Richards-Usher, 2013). In the study conducted with a special education teacher, it was stated that the teacher successfully applied differentiated instruction to each of her students (Ernest et al., 2011).

Considering that special education teachers only serve individuals with special needs, information about their level of competence in differentiated instruction and the difficulties they encounter in this process is very important. The fact that individuals with special needs can have quite different characteristics from each other makes differentiated instruction inevitable for them to benefit from the education system at its maximum level (Prater, 2006). Determining the difficulties faced by special education teachers in differentiating instruction will serve to develop suggestions to overcome the current problems. It is thought that preventing possible problems will have positive effects on teachers' in-class education and training processes. Besides, improving the education process may contribute to the educational lives of individuals with special needs and thus to their preparation for independent living.

The general purpose of this study is to determine special education teachers' perceptions regarding the factors making differentiation of instruction difficult. Conforming to this purpose, the following sub-objectives were examined:

1. What are the perceptions of special education teachers about the factors that make differentiating instruction difficult?

2. Do the perceptions of special education teachers about the factors that make differentiating instruction difficult differ by gender, age, years of experience, school level, school type, department graduated from, and previous training on differentiated instruction?

METHOD

Research Design

This research was designed with a single survey model. Research models that are conducted to determine the occurrence of variables individually, in terms of type or quantity are called single survey models. In this type of approach, the variables belonging to the event, item, individual, group, institution, subject, etc. unit and situation are tried to be described separately (Karasar, 2002).

Research Sample

The population of the study consists of special education teachers in Türkiye. The sample of the study was selected from the special education teachers working in various provinces of Türkiye who were reached through social networking groups and who volunteered to participate in the study. Convenience sampling is one of the non-probability sampling methods in which the target group of the research meets criteria such as easy accessibility and volunteerism (Etikan et al., 2016). 183 special education teachers from various provinces of Türkiye participated in the study. The demographic characteristics of the participants are given in Table 1.

This section should include subheadings such as the research model, population-sample, study group, data collection tools, validity-reliability, and data analysis. The pattern of the research should be explained in detail in this section. Instead of giving a theoretical definition of the method, the process should be explained in detail. Ethics committee approval should be detailed in the method section.

Table 1. Demographic Characteristics of the Participants

Variable	Category	N	%
Gender	Female	117	63,9
	Male	66	36,1
Age	18-25	26	14,2
	26-45	149	81,4
	46 and above	8	4,4
Year of Experience	0-10 year	130	71
	11-20 year	43	23,5
	21-30 year	10	5,5
School Level of Employment	Preschool Level (PL)	13	7,1
	Primary School Level (PSL)	60	32,8
	Middle School Level (MSL)	69	37,7
	High School Level (HSL)	41	22,4
School Type of Employment	Special Education Kindergarten (SEK)	10	5,5
	Special Education Classroom (SEC)	96	52,5
	Special Education Practice School (SEPS)	70	38,3
	Special Education Vocational School (SEVS)	7	3,8
Graduated Department	Graduate of Special Education Teaching Department	156	85,2
	Graduated from Other Departments	27	14,8
Status of Receiving Training on Differentiated Instruction	Yes	86	47
	No	97	53

According to Table 1, 117 of the special education teachers who participated in the study were female (63.9%) and 66 were male (36.1%). 26 of the participants were between the ages of 18 and 25 (14.2%), 149 were between

the ages of 26 and 45 (81.4%), and 8 were 46 and older (4.4%). 130 of the participants had 0–10 years of experience (71%), 43 had 11–20 years of experience (23.5%), and 10 had 21–30 years of experience (5.5%). Thirteen of the participants work at the preschool level (PL) (7.1%), 60 at the primary school level (PSL) (32.8%), 69 at the middle school level (MSL) (36.7%), and 41 at high school level (HSL) (22.4%). Ten of the participants work in special education kindergarten (SEK) (5.5%), 96 in special education class (SEC) (52.5%), 70 in special education practice school (SEPS) (38.3%), and 7 in special education vocational school (SEVS) (3.8%). 156 of the participants graduated from the Special Education Teaching Department (85.2%), and 27 of them graduated from other departments (14.8%). 86 of the participants had received training on differentiated instruction before (47%), while 97 did not (53%).

Data Collection Tools

Personal Information Form: The personal information form, which was created in line with the sub-objectives of the study, consists of 7 questions asking personal information such as gender, age, years of experience, school level, school type, department graduated from, and previous training on differentiated instruction.

Teacher Perception Inventory on Factors Making Differentiation of Instruction Difficult (TPIFMDISD): The scale is a five-point Likert-type measurement tool developed by Bekler and Kozikoğlu (2022) to find out teachers' perceptions about the elements that make differentiation of instruction difficult. By factor analysis, a 33-item and 6-factor structure were obtained. Cronbach's alpha values were calculated as 0.89, 0.85, 0.92, 0.80, 0.81, and 0.85 for the dimensions, respectively. The sub-dimensions of the scale were named "Teacher Characteristics", "Communication and Cooperation with Colleagues", "Teacher Education", "Family and Social Environment", "Educational System, Plan, and Program Activities" and "Physical Arrangements of the Classroom". On the scale, strongly disagree is 1 point, disagree is 2 points, partially agree is 3 points, agree is 4 points, and strongly agree is 5 points, respectively. The scale scores range between 133 and 165.

Data Collection

In order to collect the data, firstly, the data collection tools were digitised with Google Forms. Then, the tools were sent to the social networking groups of special education teachers in various provinces of Türkiye and volunteers were asked to participate in the study. The data were collected in March 2023.

Data Analysis

To decide on the tests to be conducted, the kurtosis and skewness values and the normality of the scale and subscale scores were tested with the Kolmogorov-Smirnow (K-S) Test (Can, 2017), which is applied when the group size is greater than 30, and the results are given below.

Table 2. K-S Test

	Z	Kurtosis	Skewness	*p*
TPIFMDISD	,062	,720	-,058	,082

In Table 2, the data are normally distributed [(Z =,062; kurtosis = -,720, Standard error =,357; skewness = -,058, Standard error =,189); p>,05]. Accordingly, an independent sample t-Test Analysis of Variance (ANOVA) was applied. The statistical significance level was accepted as.05. In the effect size calculation about the size of the significant difference obtained, the eta square (η^2) value was examined. For the t-test, the eta square (η^2) value was calculated with the formula [$\eta^2= t^2/ t^2+(n_1+n_2-2)$] and for the ANOVA results, it has been calculated by dividing the variance between groups by the total variance. For the interpretation of the eta square (η2) value, the cut-off points were considered "small" at η^2=0.01, "medium" at η^2=0.06, and "large" at η^2=0.14 (Büyüköztürk, 2011; Can, 2017). In cases where the "F" value obtained as a result of one-way analysis of variance was significant, Scheffe and LCD tests were applied in cases where the variances were equal to determine which groups had a significant difference between the averages. The ethics committee permission of the article was obtained by Bolu Abant İzzet Baysal University/Publication Ethics Board with the decision numbered 2023/88 dated 02.03.2023.

FINDINGS

The findings of the study are given below.

1. What are the perceptions of special education teachers about the factors that make differentiating instruction difficult?

Table 3. Mean and Standard Deviation of the Participants' Scores

	$\bar{x}$	S
Teacher Characteristics	12,92	4,26
Communication and Cooperation with Colleagues	20,38	6,69
Teacher Education	10,20	4,59
Family and Social Environment	24,62	4,89
Educational System, Plan and Program Activities	15,97	4,28
Physical Arrangements of the Classroom	13,10	4,22
Total	93,31	19,83

According to Table 3, the mean score of the participants on the Teacher Characteristics sub-dimension of the scale was 12.92. Considering the sub-scale scores range between 6 and 30, it can be said that the participants perceived a low level of difficulty in the Teacher Characteristics dimension. The mean score of the participants on the Communication and Cooperation with Colleagues sub-dimension of the scale was 20.38. Considering that the lowest score that can be obtained from this sub-dimension is 7 and the highest score is 35, it can be said that the participants perceived a moderate level of difficulty in the Communication and Cooperation with Colleagues dimension. The mean score of the participants on the Teacher Education sub-dimension of the scale was 10.20. Considering the sub-scale scores range between 4 and 20, it can be said that the participants perceived a moderate level of difficulty in the Teacher education dimension. The mean score of the participants on the Family

and Social Environment sub-dimension of the scale was 24.62. Considering the sub-scale scores range between 7 and 35, it can be said that the participants perceived a moderate level of difficulty in the Family and Social Environment dimension. The mean score of the participants on the Educational System, Plan, and Program Activities sub-dimension of the scale was 15.97. Considering the sub-scale scores range between 5 and 25, it can be said that the participants perceived a moderate level of difficulty in the Educational System, Plan, and Program Activities dimension. The mean score of the participants on the Physical Arrangements of the Classroom sub-dimension of the scale was 13.10. Considering the sub-scale scores range between 4 and 20, it can be said that the participants perceived a moderate level of difficulty in the Physical Arrangements of the Classroom dimension. The mean score of the participants in general is 93.31. Considering the scale scores range between 33 and 165, it can be said that the participants perceive a moderate level of difficulty.

2. Do the perceptions of special education teachers about the factors making differentiating instruction difficult differ by gender, age, years of experience, school level, school type, department graduated from, and previous training on differentiated instruction?

Table 4. The T-test Findings of Participants' Scores by Gender

Dimensions	Category	N	$\bar{X}$	S	Df	t	p
Teacher Characteristics	Female	117	13,09	4,18	181	,683	,495
	Male	66	12,63	4,42			
Communication and Cooperation with Colleagues	Female	117	20,13	6,43	181	-,668	,505
	Male	66	20,81	7,17			
Teacher Education	Female	117	10,16	4,53	181	-,134	,893
	Male	66	10,26	4,71			
Family and Social Environment	Female	117	24,95	4,66	181	1,221	,224
	Male	66	24,03	5,26			
Educational System, Plan and Program Activities	Female	117	16,19	4,18	181	,893	,373
	Male	66	15,59	4,46			
Physical Arrangements of the Classroom	Female	117	13,70	4,09	181	2,587	,010
	Male	66	12,05	4,27			
Total	Female	117	94,27	18,98	181	,870	,385
	Male	66	91,61	21,30			

By Table 4, according to the gender of the participants, the scores of the participants in the dimensions of Teacher Characteristics [t(181)=,683, p>.05], Communication and Cooperation with Colleagues [t(181)= -,668, p>.05], Teacher Education [t(181)= -,134, p>. 05], Family and Social Environment [t(181)= 1,221, p>.05] and Educational System, Plan and Program Activities [t(181)= ,893, p>.05] dimensions and the scale in general [t(181)= ,879, p>.05] do not show a significant difference. On the other hand, it was determined that there was a significant difference between female and male participants [t(181)= 2,587, p<.05] in the Physical Arrangements of the Classroom dimension. Female special education teachers ($\bar{X}$=13,70) perceived more difficulties in the Physical Arrangements of the Classroom dimension than male special education teachers ($\bar{X}$=11,05). According to the effect size analysis of the magnitude of the significant difference, the effect size η^2=0,04 was found. According to this, it can be said that gender has a small effect on the factors that make differentiation of instruction difficult to perceive by the participants in the Physical Arrangements of the Classroom dimension.

Table 5. The ANOVA Findings of the Participants' Scores by Age

Dimensions	Category	N	X̄	S	Df	t	p
Teacher Characteristics	18-25	26	12,81	3,66	2	,993	,373
	26-45	149	12,83	4,41			
	46 and over	8	15,00	2,73			
Communication and Cooperation with Colleagues	18-25	26	20,69	5,53	2	,981	,377
	26-45	149	20,15	6,72			
	46 and over	8	23,50	9,38			
Teacher Education	18-25	26	9,96	4,10	2	,851	,429
	26-45	149	10,13	4,62			
	46 and over	8	12,25	5,57			
Family and Social Environment	18-25	26	25,27	4,21	2	,726	,485
	26-45	149	24,42	5,03			
	46 and over	8	26,13	4,42			
Educational System, Plan and Program Activities	18-25	26	16,19	3,87	2	,368	,693
	26-45	149	15,87	4,36			
	46 and over	8	17,12	4,42			
Physical Arrangements of the Classroom	18-25	26	14,19	4,46	2	1,606	,204
	26-45	149	12,84	4,15			
	46 and over	8	14,50	4,38			
Total	18-25	26	95,15	16,74	2	1,590	,207
	26-45	149	92,38	20,08			
	46 and over	8	104,63	22,86			

According to Table 5, the participants' scale scores do not differ significantly by age in terms of Teacher Characteristics (F(2)= ,993), p>.05], Communication and Cooperation with Colleagues [F (2)= ,981, p>.05], Teacher Education (F (2)= ,851, p>.05), Family and Social Environment (F (2)= ,726, p>. 05) and Educational System, Plan and Program Activities (F(2)= ,368, p>.05) and Physical Arrangements of the Classroom (F(2)=1,606, p>.05) dimensions and the overall scale (F(2)=1,590, p>.05].

Table 6. The ANOVA Findings of the Participants' Scores by Year of Experience

Dimensions	**Category (Years)**	**N**	**X̄**	**S**	**Df**	**t**	**p**
Teacher Characteristics	0-10	130	12,88	4,057	2	,029	,971
	11-20	43	12,98	5,14			
	21-30	10	13,20	2,86			
Communication and Cooperation with Colleagues	0-10	130	19,75	6,39	2	1,971	,142
	11-20	43	21,86	7,31			
	21-30	10	22,10	7,17			
Teacher Education	0-10	130	10,15	4,40	2	,393	,676
	11-20	43	10,58	5,35			
	21-30	10	9,20	3,52			
Family and Social Environment	0-10	130	24,50	5,05	2	,115	,891
	11-20	43	24,86	4,60			
	21-30	10	25,00	4,42			
Educational System, Plan and Program Activities	0-10	130	15,87	4,34	2	,335	,716
	11-20	43	16,40	4,07			
	21-30	10	15,40	4,70			
Physical Arrangements of the Classroom	0-10	26	13,10	4,19	2	,286	,751
	11-20	149	13,33	4,18			
	21-30	8	12,20	5,12			
Total	0-10	26	92,42	19,01	2	,525	,592
	11-20	149	96,00	22,53			
	21-30	8	93,30	18,90			

By Table 6, the participants' scale scores do not differ significantly by years of experience, in terms of Teacher Characteristics (F(2)= ,029), p>.05], Communication and Cooperation with Colleagues [F(2)= 1,971, p>.05],

Teacher Education (F(2)= ,393, p>.05), Family and Social Environment (F(2)= ,115, p>. 05) and Educational System, Plan and Program Activities (F(2)= ,335, p>.05) and Physical Arrangements of the Classroom (F(2)=,286, p>.05) dimensions and the overall scale (F(2)=,525, p>.05].

Table 7. The ANOVA Findings of Participants' Scores by School Level of Employment

Dimensions	Category	N	X̄	S	Df	t	p
Teacher Characteristics	PL	13	13,15	5,16	3	,977	,405
	PSL	60	13,65	4,55			
	MSL	69	12,58	3,69			
	HSL	41	12,37	4,43			
Communication and Cooperation with Colleagues	PL	13	19,38	5,87	3	4,827	,003
	PSL	60	21,03	6,58			
	MSL	69	21,88	6,97			
	HSL	41	17,20	5,64			
Teacher Education	PL	13	9,54	4,65	3	,596	,619
	PSL	60	10,63	5,24			
	MSL	69	10,35	4,05			
	HSL	41	9,51	4,46			
Family and Social Environment	PL	13	24,38	6,20	3	3,358	,020
	PSL	60	25,83	5,12			
	MSL	69	24,71	4,30			
	HSL	41	22,76	4,63			
Educational System, Plan and Program Activities	PL	13	14,61	4,33	3	3,993	,009
	PSL	60	17,30	4,62			
	MSL	69	15,88	3,65			
	HSL	41	14,59	4,28			
Physical Arrangements of the Classroom	PL	13	11,69	4,75	3	1,178	,320
	PSL	60	13,80	4,32			
	MSL	69	13,01	3,95			
	HSL	41	12,68	4,31			
Total	PL	13	88,92	20,64	3	3,831	,011
	PSL	60	98,25	21,58			
	MSL	69	94,48	16,54			
	HSL	41	85,49	20,03			

By Table 7, there was no significant difference in the scores of the participants in the dimensions of Teacher Characteristics (F(3)= ,977), p>.05), Teacher Education (F(3) =,596, p>.05), and Physical Arrangements of the Classroom (F(3) =,320, p>.05); on the other hand, there was a significant difference in the dimensions of Communication and Cooperation with Colleagues [F(3) = 4,827, p.05, η^2=0,18], Family and Social Environment (F(3)= 3,358, p<.05, η^2=0,05) and Educational System, Plan, and Program Activities (F(3)= 3,993, p<.05, η^2=0,06) dimensions and the scale in general (F(3)= 3,831, p<.05, η^2=0,06). It was found that the school level of employment had a small effect on participants' perceptions regarding the factors making differentiation of instruction difficult in "Family and Social Environment" and "Educational System, Plan, and Program Activities" and in the overall scale, while it had a large effect in the dimension of "Communication and Cooperation with Colleagues".

Levene's test result was evaluated in order to decide on the post hoc tests to determine the source of the difference. Since the groups' variances were found to be equal, the Scheffe test was applied, and the results are given in Table 8.

Table 8. Scheffe Test Findings of the Factors That Were Found to Have a Significant Difference by the School Level of Employment

	(I) School Level of Employment	(j) School Level of Employment	Mean Difference (I-J)	Standard Error	P
Communication and Cooperation with Colleagues	PL	1.PL	-1,64872	1,98637	,876
		2.MSL	-2,49944	1,96317	,655
		3.HSL	2,18949	2,06671	,772
	PSL	1.PL	1,64872	1,98637	,876
		2.MSL	-,85072	1,14615	,907
		3.HSL	3,83821*	1,31565	,040
	MSL	1.PL	2,49944	1,96317	,655
		2.PSL	,85072	1,14615	,907
		3.HSL	4,68894*	1,28034	,005
	HSL	1.PL	-2,18949	2,06671	,772
		2.PSL	-3,83821*	1,31565	,040
		3.MSL	-4,68894*	1,28034	,005
Family and Social Environment	PL	1.PSL	-1,44872	1,46826	,808
		2.MSL	-,32553	1,45111	,997
		3.HSL	1,62852	1,52765	,768
	PSL	1.PL	1,44872	1,46826	,808
		2.MSL	1,12319	,84720	,625
		3.HSL	3,07724*	,97248	,021
	MSL	1.PL	,32553	1,45111	,997
		2.PSL	-1,12319	,84720	,625
		3.HSL	1,95405	,94639	,238
	HSL	1.PL	-1,62852	1,52765	,768
		2.PSL	-3,07724*	,97248	,021
		3.MSL	-1,95405	,94639	,238
Educational System, Plan and Program Activities	PL	1.PSL	-1,44872	1,46826	,808
		2.MSL	-,32553	1,45111	,997
		3.HSL	1,62852	1,52765	,768
	PSL	1.PL	1,44872	1,46826	,808
		2.MSL	1,12319	,84720	,625
		3.HSL	3,07724*	,97248	,021
	MSL	1.PL	,32553	1,45111	,997
		2.PSL	-1,12319	,84720	,625
		3.HSL	1,95405	,94639	,238
	HSL	1.PL	-1,62852	1,52765	,768
		2.PSL	-3,07724*	,97248	,021
		3.MSL	-1,95405	,94639	,238
Total	PL	1.PSL	-9,32692	5,92943	,482
		2.MSL	-5,55518	5,86016	,826
		3.HSL	3,43527	6,16925	,958
	PSL	1.PL	9,32692	5,92943	,482
		2.MSL	3,77174	3,42132	,750
		3.HSL	12,76220*	3,92728	,016
	MSL	1.PL	5,55518	5,86016	,826
		2.PSL	-3,77174	3,42132	,750
		3.HSL	8,99046	3,82190	,141
	HSL	1.PL	-3,43527	6,16925	,958
		2.PSL	-12,76220*	3,92728	,016
		3.MSL	-8,99046	3,82190	,141

As seen in Table 8, as a result of the Scheffe test, it was determined that there was a significant difference between participants working at PSL and participants working at HSL in the dimensions of "Communication and Cooperation with Colleagues ([Standard Error: 1,31565], p<.05), Family and Social Environment ([Standard Error: ,97248], p<.05) and Educational System, Plan and Program Activities ([Standard Error: ,97248], p<.05) and in the whole scale ([Standard Error: 3,92728], p<.05). Accordingly, it can be said that special education teachers working

at PSL perceive more difficulties in the dimensions of "Communication and Cooperation with Colleagues", "Family and Social Environment", and "Educational System, Plan and Program Activities" and the scale in general compared to special education teachers working at HSL.

Table 9. The ANOVA Findings of Participants' Scores by School Type of Employment

Dimensions	Category	N	X̄	S	Df	t	p
Teacher Characteristics	SEK	10	12,40	4,09	3	,710	,547
	SEC	96	13,24	4,49			
	SEPS	70	12,44	4,03			
	SEVS	7	14,14	3,76			
Communication and Cooperation with Colleagues	SEK	10	18,90	6,49	3	1,422	,238
	SEC	96	21,32	6,37			
	SEPS	70	19,49	7,27			
	SEVS	7	18,43	3,78			
Teacher Education	SEK	10	8,70	3,33	3	,642	,589
	SEC	96	10,02	4,81			
	SEPS	70	10,56	4,56			
	SEVS	7	11,14	3,02			
Family and Social Environment	SEK	10	23,00	5,93	3	2,102	,102
	SEC	96	25,46	4,68			
	SEPS	70	23,79	5,09			
	SEVS	7	23,71	1,89			
Educational System, Plan and Program Activities	SEK	10	13,80	3,88	3	1,884	,134
	SEC	96	16,58	4,10			
	SEPS	70	15,46	4,65			
	SEVS	7	15,71	1,11			
Physical Arrangements of the Classroom	SEK	10	10,60	4,33	3	2,676	,049
	SEC	96	13,65	4,05			
	SEPS	70	12,53	4,44			
	SEVS	7	15,00	1,83			
Total	SEK	10	83,60	13,99	3	2,032	,111
	SEC	96	96,27	18,92			
	SEPS	70	90,49	21,86			
	SEVS	7	94,71	8,958			

According to Table 9, according to the school level of the participants, there is no significant difference in the scores of the participants in the dimensions of Teacher Characteristics (F(3)= ,710), p>.05], Communication and Cooperation with Colleagues (F(3)= 1,422, p>.05), Teacher Education (F(3)= ,642, p>.05), Family and Social Environment (F(3)= 2,102, p>. 05) and Educational System, Plan and Program Activities (F(3)= 1,884, p>.05) dimensions and the scale in general (F(3)= 2,032, p>.05); however, there was a significant difference in the Physical Arrangements of the Classroom (F(3)=2,676, p<.05, η^2=0.04) dimension. It was found that the school type of employment had a small effect on the perceptions of participants about the factors making differentiation of instruction difficult in the dimension of "Physical Arrangements of the Classroom".

Levene's test result was evaluated in order to decide on the post hoc tests to determine the source of the significant difference. The Scheffe test was applied, as it was seen that the variances of the groups were equal, but no significant difference was found between the groups. Thereupon, the LCD test, one of the post hoc multiple comparison tests, was applied, and the results are given below.

Table 10. LCD Test Findings of the Factors Determined to Have a Significant Difference by the School Type of Employment

	(I) School type of employment	(j) School type of employment	Mean Difference (I-J)	Standard Error	P
Physical Arrangements of the Classroom	SEK	1. SEC	-3,04583*	1,38369	,029
		2. SEPS	-1,92857	1,40772	,172
		3. SEVS	-4,40000*	2,05209	,033
	SEC	1. SEK	3,04583*	1,38369	,029
		2. SEPS	1,11726	,65447	,090
		3. SEVS	-1,35417	1,63025	,407
	SEPS	1. SEK	1,92857	1,40772	,172
		2. SEC	-1,11726	,65447	,090
		3. SEVS	-2,47143	1,65070	,136
	SEVS	1. SEK	4,40000*	2,05209	,033
		2. SEC	1,35417	1,63025	,407
		3. SEVS	2,47143	1,65070	,136

As seen in Table 8, there is a significant difference between special education teachers working in SEK and special education teachers working in SEC ([Standard Error: 1,38369], p<.05) and SEVS ([Standard Error: -4,40000], p<.05) in the dimension of "Physical Arrangements of the Classroom". Accordingly, it can be said that special education teachers working in SEK perceive less difficulty in the dimension of "Physical Arrangements of the Classroom" compared to special education teachers working in SEC and SEVS.

Table 11. The T-Test Findings of Participants' Scores by Department They Graduated

Dimensions	Category	N	X̄	S	Df	t	p
Teacher Characteristics	Special Education Graduate	156	12,78	4,36	181	-1,079	,282
	Graduated from Other Fields	27	13,74	3,59			
Communication and Cooperation with Colleagues	Special Education Graduate	156	21,06	6,83	55,96	4,906	,000
	Graduated from Other Fields	27	16,41	4,03			
Teacher Education	Special Education Graduate	156	9,76	4,56	181	-3,151	,002
	Graduated from Other Fields	27	12,70	3,96			
Family and Social Environment	Special Education Graduate	156	24,92	4,84	181	2,049	,042
	Graduated from Other Fields	27	22,85	4,90			
Educational System, Plan and Program Activities	Special Education Graduate	156	16,14	4,38	181	1,323	,187
	Graduated from Other Fields	27	14,96	3,64			
Physical Arrangements of the Classroom	Special Education Graduate	156	13,35	4,23	181	1,880	,062
	Graduated from Other Fields	27	11,70	3,97			
Total	Special Education Graduate	156	94,09	20,40	181	1,288	,200
	Graduated from Other Fields	27	88,78	15,66			

According to Table 11, there is no significant difference between the participants' scale scores according to the department they graduated from in the dimensions of Teacher Characteristics [t(181)= -1,079, p>.05], Educational System, Plan and Program Activities [t(181)= 1,323, p>.05] and Physical Arrangements of the Classroom [t(181)= 1,880, p>.05] and the scale in general [t(181)= 1,288, p>.05]. On the other hand, in the dimensions of Communication and Cooperation with Colleagues [t(55,96)= -4,906, p<.05], Teacher Education [t(181)= -3,151, p<.05] and Family and Social Environment [t(181)= 2,049, p<.05], it was determined that there was a significant difference between the participants who graduated from the Special Education Department and those who graduated from other fields. Teachers, graduated from the Special Education Teaching

Department, perceived more difficulties in the dimensions of " Communication and Cooperation with Colleagues" and "Family and Social Environment", while they perceived less difficulties in the dimension of "Teacher Education".

According to the effect size analysis on the magnitude of the significant difference, the effect size was found η^2=0,12 in the dimension of Communication and Cooperation with Colleagues, η^2=0,02 in the dimension of Family and Social Environment, and η^2=0,05 in the dimension of Teacher Education. Accordingly, it can be said that the department of graduation has a small effect on the "Family and Social Environment" and "Teacher Education" dimensions; on the other hand, it has a moderate effect on the " Communication and Cooperation with Colleagues " dimension.

Table 12. The T-Test Findings of Participants' Scores by Previous Training on Differentiated Instruction

Dimensions	Previous raining on differentiated instruction	N	X̄	S	Df	t	p
Teacher Characteristics	Yes	86	12,43	3,90	181	-1,479	,141
	No	97	13,36	4,53			
Communication and Cooperation with Colleagues	Yes	86	20,22	6,20	181	-,296	,767
	No	97	20,52	7,13			
Teacher Education	Yes	86	9,35	3,96	178,98	-2,417	,017
	No	97	10,95	4,98			
Family and Social Environment	Yes	86	24,26	4,70	181	-,941	,348
	No	97	24,94	5,06			
Educational System, Plan and Program Activities	Yes	86	16,00	3,97	181	,097	,923
	No	97	15,94	4,56			
Physical Arrangements of the Classroom	Yes	86	12,90	3,73	179,478	-,628	,531
	No	97	13,29	4,62			
Total	Yes	86	91,31	17,80	181	-1,282	,202
	No	97	95,07	21,40			

According to Table 12, there is no significant difference between the participants' scale scores according to the participants' previous training on differentiated instruction in the dimensions of Teacher Characteristics [t(181)= -1,479, p>.05], Communication and Cooperation with Colleagues [t(181)= -,296, p>. 05], Family and Social Environment [t(181)= -,941, p>.05], Educational System, Plan and Program Activities [t(181)= ,097, p>.05] and Physical Arrangements of the Classroom [t(181)= -,628, p>.05] dimensions and the scale in general [t(181)= -1,282, p>.05]. On the other hand, in the dimension of Teacher Education [t(178,98)= -2,417, p<.05], it was determined that there was a significant difference between the participants who had and had not received training on differentiated instruction before. Teachers who did not receive training on differentiated instruction perceived more difficulties in the dimension of "Teacher Education" than the teachers who received training on this subject. The effect size η^2=0,03 was found in the Teacher Education dimension. According to this, it can be said that previous training on differentiated instruction has a small effect on the factors that make differentiation of instruction difficult to perceive by the participants in the Teacher Education dimension.

CONCLUSION and DISCUSSION

This study aimed to find out special education teachers' perceptions regarding the factors that make differentiated instruction difficult. In this section, the findings obtained for this purpose are discussed and interpreted within the framework of the related literature.

Regarding the first finding of the study, it was determined that the participants perceived a low level of difficulty in the dimension of "Teacher Characteristics" and a moderate level of difficulty in the dimensions of "Communication and Cooperation with Colleagues", "Teacher Education", "Family and Social Environment", "Educational System, Plan and Program Activities" and "Physical Arrangements of the Classroom" and the scale in general. When evaluated within the scope of sub-dimensions, the sub-dimension with the lowest mean in differentiating instruction was "Teacher Characteristics" and it was seen that this dimension had a value below the average. Dixon et al. (2014) and Kiley (2011) state that teacher characteristics and competencies are important factors in implementing differentiated instruction. Aldossari (2018) also stated that one of the difficulties experienced in differentiated instruction is teacher characteristics. Çam (2013) determined in his study that teachers' implementation levels of the differentiated instruction approach were at an average level. Kozikoğlu and Bekler (2018) found that teachers' general competencies for a differentiated instruction approach were high. Mutlu and Öztürk (2017) found that teachers' perceptions and practices of differentiated instruction in social sciences courses were at a high level. Gülay (2021), Demirkaya (2018), Burkett (2013), Whipple (2012), and Richards-Usher (2013) found that classroom teachers' perceptions regarding the level of implementation of differentiated instruction were high. Siam and Al Natour (2016) and Kiley (2011), on the other hand, concluded that the level of teachers' implementation of differentiated instruction was low. When the recent research was examined, both similarities and differences with the findings of this study were observed. In accordance with the research results, it can be suggested that teachers should be informed about differentiating instruction. In-service training and seminars can be organized for teachers to receive training on differentiating instruction.

Examining the second finding of the study, no significant difference was noticed in the scores of the participants in the dimensions of "Teacher Characteristics", " Communication and Cooperation with Colleagues ", "Teacher Education", "Family and Social Environment" and "Educational System, Plan, and Program Activities" and the scale in general; however, there has been a significant difference among male and female participants in the Physical Arrangements of the Classroom dimension. Female special education teachers perceived more difficulties in the Physical Arrangements of the Classroom dimension than male special education teachers. It was determined that gender had a small effect on the factors making differentiation of instruction difficult as perceived by the participants in the Physical Arrangements of the Classroom dimension. Kargın et al. (2010) concluded in their research that female teachers attach more importance to physical arrangements than male teachers. Gülay (2021) and Demirkaya (2018) found that female teachers' perceptions of implementing differentiated instruction were higher than those of male teachers. Kozikoğlu and Bekler (2018) and King (2010),

on the other hand, found that teachers' competencies in differentiated instruction did not show a significant difference by gender.

It was determined that the participants' scores did not show a significant difference in the sub-dimensions or the overall scale by age or years of experience. The more experience teachers have with students, the more they have the opportunity to know that student (Senemoğlu, 2013). Considering that they are more competent in situations such as getting to know students, recognizing their differences, and acting accordingly, and therefore years of experience will enable them to see themselves as more competent in differentiated instruction, this finding of the study can be said to be remarkable. Gülay (2021) found that classroom teachers' perceptions of implementing differentiated instruction did not differ by age. Like the research, Kozikoğlu and Bekler (2018) concluded that there was no significant difference in the level of teachers' perception of the implementation of differentiated instruction according to years of professional experience. In this respect, it can be said that the result of the research supports the recent research. Unlike the result of this research, Demirkaya (2018) found that the perception levels of classroom teachers with 31 years of professional seniority and above according to years of experience were higher than the perception levels of classroom teachers with 6-10, 11-15, 16-20 and 21-25 years of experience. It can be stated that as years of professional experience increase, teachers consider themselves more competent to differentiate instruction.

It was determined that the participants' scores did not show a significant difference in the dimensions of "Teacher Characteristics", "Teacher Education" and "Physical Arrangements of the Classroom" according to the school level where they worked; however, there has been a significant difference in the dimensions of "Communication and Cooperation with Colleagues", "Family and Social Environment" and "Educational System, Plan, and Program Activities" and the overall scale. It has been determined that the school level has a small effect on the perceptions of special education teachers about the factors making differentiation of instruction difficult on "Family and Social Environment" and "Educational System, Plan, and Program Activities" and the scale in general, while it has a large effect on the dimension of "Communication and Cooperation with Colleagues". It was determined that special education teachers working at the primary school level perceived more difficulties in the dimensions of "Communication and Cooperation with Colleagues ", "Family and Social Environment", and "Educational System, Plan, and Program Activities" and in the overall scale compared to special education teachers working at the high school level. Demirkaya (2018) found no significant difference between the perception levels of classroom teachers working at different grade levels regarding differentiated instruction.

It was determined that the participants' scores did not show a significant difference in the dimensions of "Teacher Characteristics", "Communication and Cooperation with Colleagues", "Teacher Education", "Family and Social Environment" and "Educational System, Plan, and Program Activities" and the scale in general; however, there was a significant difference in the dimension of "Physical Arrangements of the Classroom". It was seen that the school type of employment has a small effect on the perceptions of participants about the factors making differentiation of instruction difficult in the dimension of "Physical Arrangements of the Classroom". It was

determined that special education teachers working in special education kindergartens perceived less difficulty in the dimension of "Physical Arrangements of the Classroom" compared to special education teachers working in special education classrooms and special education vocational schools. Demirkaya (2018) stated that the perception levels of classroom teachers working in private schools on implementing differentiated instruction were higher than the perception levels of classroom teachers working in public schools on implementing differentiated instruction.

It was determined that there was no significant difference between the participants' SFGFE scores in the dimensions of "Teacher Characteristics", "Educational System, Plan, and Program Activities" and "Physical Arrangements of the Classroom" and the overall scale; however, there was a significant difference between the participants who graduated from the Department of Special Education and the participants who graduated from other fields in the dimensions of "Communication and Cooperation with Colleagues ", "Teacher Education" and "Family and Social Environment". Teachers who graduated from Special Education Teaching Department, perceived more difficulties in the dimensions of "Communication and Cooperation with Colleagues " and "Family and Social Environment", while they perceived fewer difficulties in the dimension of "Teacher Education". It was seen that the department of graduation had a small effect on the "Family and Social Environment" and "Teacher Education" dimensions; on the other hand, it had a moderate effect on the "Communication and Cooperation with Colleagues " dimension. Çam (2013) found that the level of teachers' implementation of differentiated instruction did not differ by the department they graduated from. Driskill (2010) concluded that there was no difference in differentiating instruction according to the department they graduated from since the same strategies were used in all branches. In line with these findings, it can be suggested that applied courses should be added to the undergraduate programs of teachers for differentiating instruction, and teachers should be trained according to the procedures of differentiated instruction through various seminars that can be organized. In order to implement this approach correctly, practical information should be provided in addition to theoretical knowledge.

Examining the last finding of the study, no significant difference was noticed in the scores of the participants in the dimensions of "Teacher Characteristics", "Communication and Cooperation with Colleagues", "Family and Social Environment", "Educational System, Plan and Program Activities" and "Physical Arrangements of the Classroom" and the overall scale according to the participants' previous training on differentiated instruction; however, there was a significant difference in the dimension of Teacher Education between the participants who had and had not received training on differentiated instruction. Teachers who did not receive training on differentiated instruction perceived more difficulties in the "Teacher Education" dimension than teachers who received training on this subject. It was seen that receiving training on differentiated instruction had a small effect on the Teacher Education dimension. Kurnaz and Arslantaş (2018), Dixon et al. (2014), Burkett (2013), and Richards-Usher (2013) found that teachers who had previously received training on differentiated instruction had higher perceptions of implementing the differentiated instruction approach. Considering the recent research, it may be stated that participating in training on differentiated instruction improves teachers'

perceptions of implementing this approach. In this respect, it can be suggested that in-service training on differentiated instruction should be made widespread, and teachers should be encouraged to participate in this training.

SUGGESTIONS

As a result, it was determined that the participants perceived a moderate level of difficulty regarding the factors that make it difficult to differentiate instruction. In addition to this research, which is limited to quantitative data collection tools, it may be recommended to collect more in-depth data on the factors making differentiation of instruction difficult by conducting observations and interviews in future studies. In addition, it may be recommended to conduct new research with teachers from different branches to examine their perceptions about the factors that make differentiated instruction difficult. It is thought that it would be useful to organize in-service trainings on differentiating instruction for teachers who are currently working, and to add courses on the subject to the curriculum at the undergraduate level.

ETHICAL TEXT

This article complies with the journal's writing rules, publication principles, research and publication ethics rules, and journal ethics rules. The responsibility for any violations that may arise regarding the article belongs to the author. The ethics committee permission of the article was obtained by Bolu Abant İzzet Baysal University/Publication Ethics Board with the decision numbered 2023/88 dated 02.03.2023.

Author(s) Contribution Rate: The author's contribution rate in this study is 100%.

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