Educational Policy Analysis and Strategic Research, V17, N1, 2022

Developing a Curriculum Efficacy Perception Scale for Teachers Educating Gifted Students

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Abstract

The aim of this study is developing a valid and reliable curriculum efficacy perception scale for teachers working with gifted students. Viewing the difference between variables of teachers'gender, field of study, age, seniority in the profession and seniority of working with gifted. The research was carried out with 350 teachers for Exploratory Factor Analysis, 382 for Confirmatory Factor Analysis, and 283 teachers for the analysis of the scale according to variables. As a result of the exploratory factor analysis conducted in the study, it was concluded that 35 items in the scale were gathered under three factors. As a result of the exploratory factor analysis, three factors explained 66.70% of the total variance for the whole scale. The value of the Cronbach Alpha (α) for the whole scale was highly reliable with .972. The findings of the research show that the scale of "Curriculum Efficacy Perception of Teachers Working with Gifted" is valid and reliable. The scale was applied to 283 teachers and viewed in accordance with the variables. It has been revealed that the scale dimensions of the teachers do not differ according to gender, field of study, age, seniority in the profession. However it differs for the subdimensions of seniority of working with gifted.

Keywords: Gifted students, teacher of gifted, curriculum efficacy perception scale

DOI: 10.29329/epasr.2022.248.10

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Introduction

The concept of giftedness, has many different definitions that have been discussed for centuries. Anderson (2000) argues that there are about three hundred different definitions of giftedness. Some of these definitions are as follows. The American Ministry of Education, in the Marland Report (Marland, 1971); defined it as the phenomenon of showing extraordinary ability within an advanced level of performance. In addition to this definition, six different advanced performance areas are listed in the report. While these areas are general intellectual ability, distinctive academic ability, creative/productive thinking, leadership ability, visual and performance arts ability, and psycho-motor ability, these areas also show that giftedness can emerge in different areas.

In the definition of giftedness made by the Ontario Ministry of Education in 1984, it has been accepted as showing learning skills that vary upper level school programs and displaying an unusual/top level domain of intellectual ability (Hoge, 1988).

According to Baykoç-Dönmez (2011); gifted and talented; In one, several or all areas of physical growth and development, cognitive-mental development, ability to understand and express oneself, social, emotional development and aesthetic development, which can be observed or measured by experts with various observation and measurement tools, the individuals the state of being at a higher level than their peers. Among gifted individuals, those who differ extraordinarily from their peers are considered gifted individuals (Sönmez, 2011).

Renzulli (1986); suggested that giftedness consists of three components and explained these components as commitment to task, above-average ability and creativity. Commitment to the task can be explained in simple terms as completing a task started or not leaving a task unfinished. In other words, it can also mean commitment to the task, being motivated. Above-average ability has been used in this theory to explain and distinguish between both general abilities and specific abilities. Moreover, in simple terms, above-average ability can be defined as having above-average potential in any field. Creativity is flexibility, fluency and originality in thought; It consists of a combination of concepts such as being open to experiences, sensitivity to situations and taking risks.

One of the most important factors in the educational development of gifted individuals has been teachers (Gökdere&Ayvacı, 2004; Lassing, 2009). Planning, preparation and implementation of education programs for gifted students is one of the most studied and researched areas. Due to the individual characteristics and abilities of gifted students; It is not possible to talk about a single agreed program for the education of these students. The primary purpose of gifted programs is to provide opportunities for gifted children and youth to meet educational needs that cannot be met in traditional classrooms. Through these opportunities, gifted students will be able to develop their talents by receiving education appropriate to their potential (Emir, 2017). Gifted students may be more affected

by their teachers' attitudes than other students. In addition to having the qualifications of all good qualified teachers, the teachers of these students should also have mastery about the characteristics of special talents and the models, strategies, methods and techniques used in the education of these students (Sak, 2010).

The extent to which the effects of teachers on the development of students constitute a significant and important dimension is a phenomenon that has been discussed by education researchers. However, teachers who are expected to positively affect the development of students are expected to have a range of competencies. According to MEB (2008), competence is the state of having the professional knowledge, skills and attitudes required to perform duties specific to a profession. The concept of competence is the characteristics that must be possessed in order to perform a job or task effectively. Competence is a concept that expresses the abilities, knowledge and skills needed to perform a task and fulfill the responsibilities required by the task. This concept emphasizes the capacity to fulfill a certain task or role at an acceptable level (Şahin, 2004). The truth that reason and common sense told educators and parents a long time ago becomes clearer day by day as a result of research. As a result, the quality of the teacher is very important. The knowledge and skills of teachers are the most important factor affecting students' learning at school. The qualifications of teachers are even more important for children who need special education (Leigh & Mead, 2005).

Regardless of which education option they receive or in the educational environment, it can be thought that the gifted student can naturally see the greatest impact from his teachers. Emphasizing that teachers should take a series of precautions in programming, planning, implementation and evaluation in the classroom environment, since the interest, learning speed and depth of gifted children are different from those of other children; draws attention to the fact that teachers of special talents should have some different characteristics and equipment. It is significant that teachers take the lead for the academic and personal development of gifted students. For this purpose, Program Model for Supporting Interpersonal Communication Skills for Gifted Students to increase the personal and interpersonal communication skills of gifted students has been developed for gifted students (Kara, 2020). In this context, it can be argued that teachers who will teach gifted students should have different standards and competencies compared to general education teachers (Metin&Dağlıoğu, 2004). For gifted students, the logic of curriculum development can also work according to general curriculum development models in general. However, differentiation strategies should also be used within the scope of curriculum development in these students. Therefore, gifted students should know and be able to apply differentiation strategies comprehensively by their teachers. Differentiation is not leaving the program to be implemented to meet the readiness needs of students, but changing the curriculum interesting according to student levels (Tomlinson& Strickland, 2005). In this context, due to the recent trends in the education system for heterogeneous classes (for

enrichment programs), where gifted and normal students receive special education together using the same curriculum structure and classroom environment, such content knowledge proficiency is required for both normal and gifted program teachers (Ehlers and Montgomery,1999; Chipego, 2004). It is necessary for teachers to design the education process especially according to the individual suitability of the student. According to Heacox (2002) it is necessary to determine how students differ from others in terms of interest, learning styles, learning speed and readiness before they start teaching. Accordingly, after the interests and needs are determined, it is necessary to master the curriculum development, assessment and evaluation techniques that should be applied according to these students.

There are ten competencies developed by VanTassel-Baska and Johnsen (2007) by analyzing the differences in current teacher competency domain standards. The principles in these teacher competence areas are named as the characteristics and development of gifted students, individual learning differences, teaching strategies, learning environments and social interaction, language and communication, instructional planning, evaluation, professional and ethical practices, cooperation. Therefore, it can be said that the competencies that teachers working with gifted students should have are to offer a teaching environment according to the individuality of gifted students and to have the capacity to prepare programs specific to them. For the development and advancement of education levels for societies, it is of great importance that teachers develop their competencies for gifted students. For this reason, as with teachers in other fields, the perception of program efficacy towards teachers of gifted students should be measurable. In this context, it is scientifically important to develop a measurement tool that can measure these competencies and bring it into the literature.

In this study, a program efficacy perception scale, which includes the characteristics of gifted students and the curriculum development elements specific to them, was developed and applied to teachers educatinggifted students. In this direction, the scale that can be applied in line with the scientific purposes aimed for teachers in the literature is seen as a necessary element in the field of gifted education.

The main purpose of this research is to develop a valid and reliable curriculum efficacy perception scale for teachers educating gifted students.

In addition, answers to the following questions were answered in the study.

In the competencies of teachers, is there a significant difference between;

a. gender

b. age,

c. branch,

d. working time in the profession,

e. working time in giftededucation.

Method

A descriptive survey model was used in this study to determine the curriculum efficacy perceptions of teachers educatinggifted students. The descriptive survey model aims to reveal a situation as it exists (Karasar, 2013). In the study, it was also aimed to reveal the curriculum efficacy perceptions of the teachers with the scale developed in the study. This study is in accordance with the descriptive survey model in terms of revealing a valid and reliable curriculum efficacy perception scale for teachers educating gifted students. In this context, in order to develop a scale and collect data in the research, systematically scanning the relevant literature, conducting teacher interviews, creating an item pool, getting expert opinion, determining the content validity index with the Lawshe technique, providing construct validity and reliability, and data collection with the developed scale were performed.

Population and Sample of the Research

The universe of this research consisted of 2223 Science and Art Center (BİLSEM) teachers educating gifted students. In the study, 3 independent samples were taken by random sampling method. Scale applications were applied to 350 teachers in total for exploratory factor analysis, 382 teachers for confirmatory factor analysis, and 283 teachers in order to determine program competencies and make comparisons according to independent variables. There are different opinions about sample size in scale development. While Tavşancıl (2014) says that the number of items should be ten times, Tabachnick and Fidel (2007) consider five times as sufficient. In this context, Child (2006) evaluates 300 as sufficient and 1000 as excellent in the number of samples. The 3 samples of this study are more than 7 times the number of items. In addition, since the universe of teachers educating gifted students in BİLSEMs across Turkey is 2223 in general, the number of samples reached for this study is sufficient.

Data Collection

In this study, the program efficacy perception scale of teachers educating gifted students was developed and used to collect data. The scale consisted of 35 items and 3 sub-dimensions and was prepared in a 5-point likert type. The development process of the scale is given below under the title of validity and reliability studies of the draft scale.

Validity and Reliability Studies of the Draft Scale

A literature review was conducted to create an item pool in the development of the program efficacy perception scale of teachers educatinggifted students. In addition, interviews were conducted with 15 teachers educatinggifted students. In the interviews, questions were asked about the situations that the teachers saw in themselves as lacking. As a result of literature review and teacher interviews, an item pool consisting of 49 items was created. The Lawshe technique was applied to 26 experts to ensure the content validity of the scale. The content validity ratio calculation technique was developed by Lawshe (1975). In the Lawshe technique, a minimum of 5 and a maximum of 40 expert opinions are needed. This approach, known as the Lawshe technique, consists of 6 stages.

a) Establishment of the field experts group

b) Preparation of draft scale forms

c) Obtaining expert opinions

d) Obtaining coverage validity rates for items

e) Obtaining content validity indices for the scale

f) Creation of the final form according to the content validity rates/index criteria

Accordingly, the content validity rates are obtained by collecting the opinions of the experts on any item. Content validity ratios (CVRs) are obtained by 1 minus the ratio of the number of experts who stated their opinion of "appropriate" on an item to the total number of experts who gave their opinion on the item

$$CVR = \frac{NE}{N/2} - 1$$

Here; NE indicates the number of experts who say “appropriate” to the item, and N represents the total number of experts who have expressed an opinion on the item (Lawshe, 1975). In this context, opinions were taken from a total of 26 field experts in this study. As a result of the Lawshe technique, the items to be removed from the scale were determined.

According to the calculations of AyreandScally (2014) using the CRITBINOM function returned values for the critical number of experts 1 fewer for all panel sizes compared with the calculations shows that, the CVR lower value should be 0,385.In this study, 4 items (1,4,17,30) with

0.385 and below as a result of CVR calculations and shown in Table 1 were excluded from the item pool. As a result, 45 items were found suitable for exploratory factor analysis.

Table 1.CVR Values of The Items As A Result of the Lawshe Technique

ITEM NO	CVR*	ITEM NO	CVR*	ITEM NO	CVR*	ITEM NO	CVR*	ITEM NO	CVR*
1	0,153	**11**	0,615	**21**	0,923	**31**	0,769	**41**	0,769
2	0,538	**12**	0,923	**22**	0,846	**32**	1,00	**42**	0,692
3	0,615	**13**	1,00	**23**	0,538	**33**	0,615	**43**	1,00
4	0,385	**14**	0,692	**24**	0,538	**34**	0,846	**44**	0,923
5	0,769	**15**	0,846	**25**	0,538	**35**	0,746	**45**	0,923
6	0,769	**16**	0,461	**26**	0,615	**36**	0,846	**46**	0,769
7	0,692	**17**	0,385	**27**	1,00	**37**	0,769	**47**	0,846
8	0,769	**18**	1,00	**28**	0,846	**38**	0,846	**48**	0,923
9	0,846	**19**	1,00	**29**	0,923	**39**	0,846	**49**	1.00
10	0,538	**20**	0,923	**30**	0,260	**40**	0,769		

Content Validity Index (CVI) = 0.792

Exploratory factor analysis (EFA) was performed for construct validity analysis of the 45-item draft scale data formed after the Lawshe technique. "KMO" (Kaiser-Meyer-Olkin) and "Bartlett Sphericity" tests were performed to evaluate the suitability of the data obtained in the study for EFA. According to Tavşancıl (2014), the Kaiser-Meyer-Olkin (KMO) test should be performed to determine the adequacy of the data obtained from the sample in factor analysis. For the validity and reliability of the scale, exploratory factor analysis was performed using the principal component analysis method and the Direct Oblimin rotation technique. The reliability coefficient of the measurement tool was calculated. The Cronbach Alpha (α) value was used as the reliability coefficient. In addition, confirmatory factor analysis (CFA) of the structure obtained in the study was performed.

Exploratory Factor Analysis

Before performing Exploratory Factor Analysis (EFA), the suitability of the data for factor analysis was examined. The result of the analysis is shown in Table 2. It is an excellent value when the value calculated in the KMO test approaches 1.00; a value below 0.5 is unacceptable. If it is over 0.6 and the Barlett test is significant, it indicates that the data in the scale come from a multivariate normal distribution and are suitable for factor analysis (Büyüköztürk, 2002). In the study, the KMO value of the scale was calculated as 0.965 and the Bartlett test was found to be significant. These values examined showed that factor analysis could be done.

Table 2.KMO-Bartlett Test Result Related to the Scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		,965
Bartlett's Test of Sphericity	Approx. Chi-Square	14817,032
	Df	990
	Sig	,000

As the first step in the factor analysis, the step of determining the number of dimensions was determined. For this purpose, principal component analysis was performed to determine the factor structure of the scale (Table 3). As a result of this process, 5 factors with the eigen value of the scale greater than 1 were determined. It was determined that the factors after the third factor overlapped and their contribution to the total variance was low. In addition, as seen in the scree plot in Figure 1, the first high-accelerated drop was seen in the third factor.

Table 3. The Initial Eigenvalues of the Factors and The Initial Variances They Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	23,121	51,379	51,379	23,121	51,379	51,379
2	3,451	7,668	59,047	3,451	7,668	59,047
3	1,950	4,334	63,380	1,950	4,334	63,380
4	1,200	2,666	66,047	1,200	2,666	66,047
5	1,001	2,225	68,272	1,001	2,225	68,272

ExtractionMethod: Principal Component Analysis.

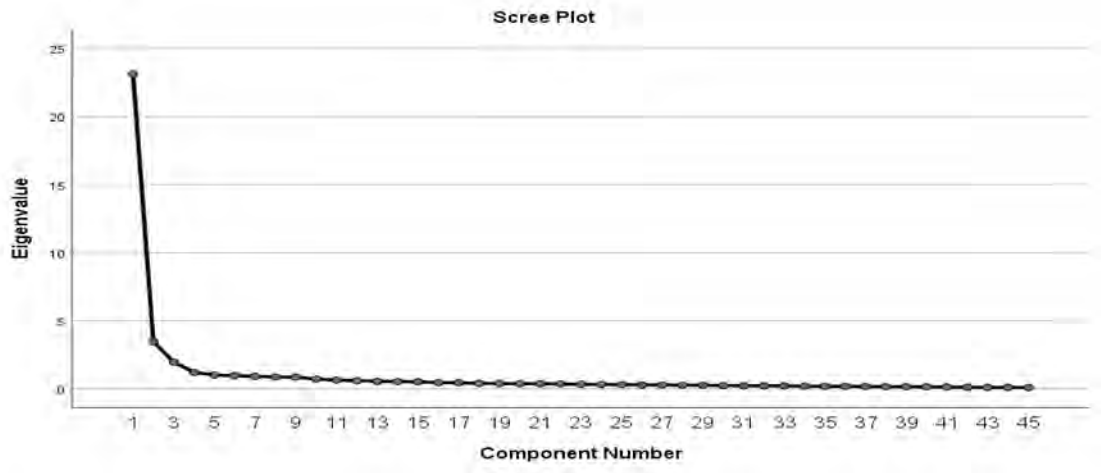

Figure 1. Scree-Plot Chart

Scree-plot drawn without factor limitation to determine the number of dimensions is shown in Figure 1. In addition, it was decided to group the items in three factors by comparing them with the

total variance and scree plot explained for the scale items. Although the 23% explanation of the total variance of the first factor indicates that the scale may be unidimensional, the fact that the three-factor structure explains approximately 63% of the total variance supports the decision that the scale should have three factors.

Principal component analysis was repeated using the Directoblimin vertical rotation method to clarify the data structure. Items with a factor loading and total variance value of less than 0.45 and items with an item-total correlation of less than 0.45 and a load difference of less than 0.10 were excluded from the scale. In determining the number of dimensions, it became clear that 3 factors with explained variance greater than 5% should be emphasized and explained 66,701 % of the total variance. The eigenvalues of the factors and their explained variance ratios as a result of the rotations are shown in Table 4.

Table 4. Eigenvalues of the Factors and Their Explained Variances

	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	18,443	52,694	52,694	18,443	52,694	52,694
2	3,054	8,726	61,420	3,054	8,726	61,420
3	1,848	5,281	66,701	1,848	5,281	66,701

When the loadings of the items in the factors were examined, among the load values in more than one factor, the items with a factor load below 0.45 and the items that did not load any factor (1,2,3,4,15,22,23,27,28,29) were excluded from the scale (Büyüköztürk, 2018). After these items were removed, the factor loads of the 3-dimensional "Scale of Curriculum Perception of Teachers Educating Gifted Students" consisting of 35 items are shown in Table 5.

There were 15 items in the 1st dimension, 11 items in the 2nd dimension, and 9 items in the 3rd dimension. The factor loading values of the scale varied between ,499 and ,880. The 1st dimension explained 52,964 % of the total variance, the 2nd dimension 8,726%, and the 3rd dimension 5,281 and the total variance of the 3 dimensions was 66,701 %. The distribution of the items of the scale according to the sub-factors and their factor loads are shown in Table 3 above. In addition, the sub-dimensions determined as a result of factor analysis and the items loaded in these dimensions are shown in Table 5.

Table 5. Sub-dimensions Determined as a Result of Factor Analysis and Items Loaded in These Dimensions

Factor	Total of Items	Number of Items
Factor 1	15	31,32,33,34,35,36,37,38,39,40,41,42,43,44,45

Factor 2	11	5,6,7,8,9,10,11,12,13,14,19
Factor 3	9	16,17,18,20,21,24,25,26,30

As seen in Table 5, factor 1 consists of 15 items (31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45), and factor 2 consists of 11 items (5,6,7,8,9,10,11,12,13,14,19), Factor 3 consisted of 9 items (16,17,18,20,21,24,25,26,30). The items in each dimension were examined and named. The first sub-dimension was named "Curriculum Development Knowledge", the second sub-dimension was named "Applicability according to Student", and the third sub-dimension was named "Assessment and Evaluation Knowledge".

Table 6. Dimension Factor Loadings, Factor Common Variance, Item-Total Correlation and T-Test Analysis Results of 27% Lower and Upper Groups of Scale Items

Item No	Factors			Comunalities	Item-Total Correlation	27% group t-test results.
	Curriculum Development Knowledge	Applicability according to Student	Assessment and Evaluation Knowledge			
42	0,880			0,811	0,797	18,693
41	0,870			0,786	0,784	18,139
43	0,854			0,785	0,789	18,514
40	0,848			0,780	0,787	17,926
44	0,827			0,748	0,780	18,756
39	0,814			0,711	0,753	17,571
37	0,775			0,541	0,626	12,426
38	0,753			0,519	0,611	12,287
36	0,722			0,671	0,763	17,325
32	0,718			0,718	0,798	18,286
34	0,701			0,657	0,749	16,986
31	0,696			0,718	0,790	19,557
33	0,651			0,658	0,757	19,398

35	0,595			0,714	0,801	18,875
45	0,499			0,572	0,751	17,924
11		0,840		0,631	0,575	12,943
12		0,787		0,645	0,645	17,792
8		0,765		0,680	0,692	21,659
13		0,752		0,581	0,607	14,283
9		0,735		0,668	0,696	18,462
5		0,692		0,661	0,703	23,169
14		0,673		0,626	0,698	19,964
19		0,663		0,509	0,535	11,356
10		0,646		0,653	0,732	18,135
6		0,645		0,629	0,672	20,032
7		0,631		0,615	0,670	21,454
20			0,851	0,750	0,726	19,313
21			0,793	0,734	0,744	17,251
18			0,766	0,681	0,713	16,776
26			0,694	0,739	0,788	19,306
25			0,686	0,726	0,778	18,823
24			0,628	0,667	0,749	18,954
30			0,600	0,535	0,679	16,278
17			0,597	0,703	0,794	20,727
16			0,560	0,524	0,656	14,281

Independent groups t-test was applied between 27% lower group and upper group according to the scale total score of the scale obtained for item analysis. The t-test results applied are shown in Table 6. According to the results of the analysis, it was determined that the item score averages of the upper 27% group for all items were significantly ($p<.001$) higher than the item score averages of the lower 27% group. According to Table 6, t-test values vary between 11,356-23.169. According to this result, the items in the scale can significantly distinguish participants with different competencies.

The reliability coefficient of the measurement tool was calculated. The Cronbach Alpha (α) value was used as the reliability coefficient. Cronbach Alpha (α) value for the 1st dimension is highly reliable with .963, Cronbach Alpha (α) value for the 2nd dimension is highly reliable with .936, and Cronbach Alpha (α) value for the 3rd dimension is .935 highly reliable and the Cronbach Alpha (α) value for the whole test was .972, which was highly reliable. A reliability coefficient of 0.70 or higher is considered sufficient for the reliability of test scores (Büyüköztürk, 2018).

Confirmatory Factor Analysis

Confirmatory Factor Analysis (CFA) was conducted to determine the measurability of latent structures of this scale, which measures three sub-structures of the scale of attitude towards the competencies of teachers educating gifted students. It is aimed to examine the structure revealed by descriptive factor analysis by performing a confirmatory factor analysis in another sample. In this direction, a new sampling scale of 382 people was applied.

Confirmatory factor analysis was performed using the AMOS program. In line with the relevant analysis; $\chi 2/df$ (Chi-Square/Degree of Freedom), RMSEA (Root Mean Square Error of Approximation), NFI (Normed Fit Index), CFI (Comparative Fit Index), and SRMR (Standardized Root Mean Square Residual) values are discussed. The path diagram for confirmatory factor analysis is shown in Figure 2.

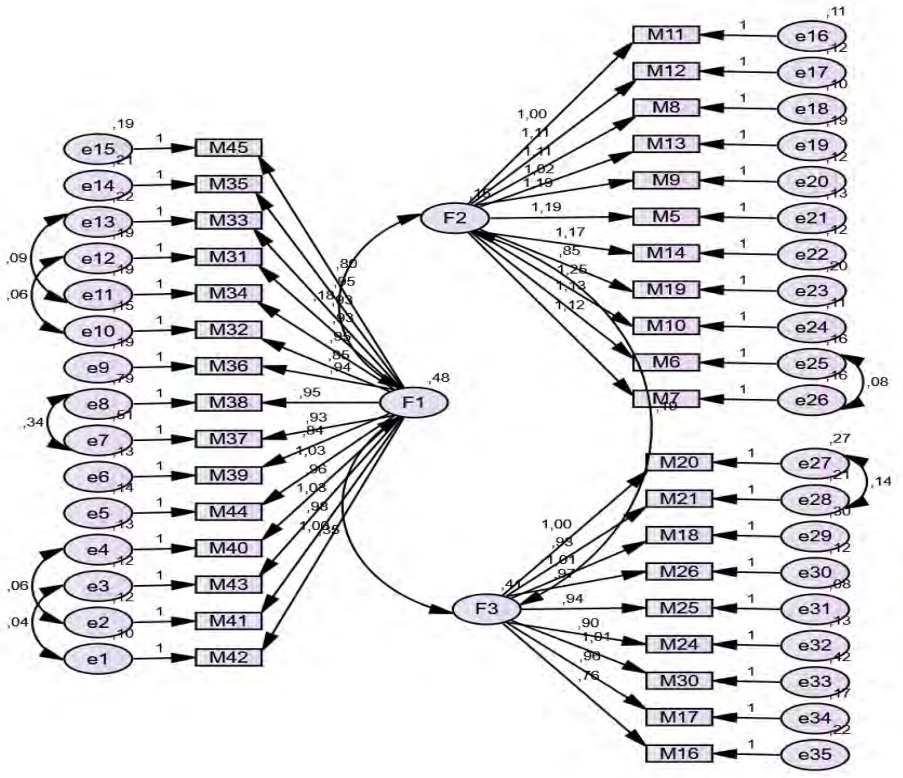

Figure 2. Confirmatory Factor Analysis Results

In this context, Chi-square (x2= 2.985, sd= 550,p=0.00) was found when the fit index values were analyzed as a result of the CFA applied regarding the structure of the scale, which consisted of 35 items and the three factors formed by these 35 items, and the results of the analysis carried out considering the suggested modifications on the model. Value was found to be significant. The fit index values were found to be RMSEA= .072, NFI= .89, CFI= .92, IFI= .92, TLI=0.91 RMR= .025.

In the literature, some fit criteria are used to evaluate the results obtained as a result of CFA. Accordingly, a χ2 /df ratio of 2 or less, a RMSEA value of .05 or less, and a CFI value of .95 and above indicate a good fit for model data fit; A χ2/sd ratio between 2 and 5, a RMSEA value of less than .08, and a CFI fit value of .90 or above are considered to indicate an acceptable level of model-data fit (Çokluk, Şekercioğlu&Büyüköztürk, 2010; Schumacker& Lomax, 2004; Şimşek, 2007). Based on these data in the literature, when the fit indices of the study are examined, the χ2/df fit value of 2.985 shows that the model data fit is at an acceptable level. In the study, the SRMR index value was calculated as 0.025. According to Schermelleh-Engel, Moosbrugger& Müller (2003), this value shows that the model has an acceptable fit. The GFI value was calculated as 0.90. The fact that these values are 0.90 and above indicates that the model fits well (Schumacker&Lomax, 2010). The RMSEA value was calculated as 0.072. According to Schermelleh-Engel, Moosbrugger& Müller

(2003), this value model seems to have an acceptable fit. The CFI value was calculated as 0.92. According to Sümer (2000), this value being 0.90 and higher indicates that the model fits well.

Table 7. Fit Index Values of the Model

Index	Normal Value	Acceptable Value	Fit Values of the Current Model	Fit
NFI	>0.95	>0.90	0,89	Acceptable
TLI	>0.95	>0.90	0,91	Acceptable
CFI	>0.95	>0.90	0,92	Acceptable
RMSEA	<0.05	<0.08	0,072	Acceptable
RMR	<0.05	<0.08	0,025	Acceptable
X^2 p value	p>0.05		0,00	Acceptable
X^2/sd	<2	<5	2,985	Acceptable

Analysis of Data

The scale, the validity and reliability of which was proven as a result of CFA, was compared in terms of the level of having program efficacy perceptions of teachers working in science and art centers and different variables. Before the analysis of the data, normality tests of the data distribution according to the variables were performed. For the normality distribution, the Shapiro Wilks test was used for variables with a frequency of less than 50, and the Kolmogorow-Smirnow test for those with a frequency greater than 50. When the normality assumptions of all variables were examined, it was revealed that they did not show normal distribution, so non-parametric tests Mann Whitney-U and Kruskall Wallis-H tests were used to make comparisons.

Results

In this part of the study, comparisons of the program efficacy perceptions of teachers educatinggifted students in terms of gender, age, branch, working time in the profession and working time with special talents are given in line with the scale developed within the scope of the study.

After the exploratory and confirmatory factor analysis, 3 dimensions emerged in the scale, which was developed to realize the purpose of the study. The scale was created by determining the first dimension as program information, the second dimension as applicability according to the student, and the third dimension as measurement and evaluation information. In order to collect data in line with research problems, the first dimension of the scale form to be applied in order to make

comparisons in terms of gender, age, branch, working time in the profession and working time with special talents was listed as applicability according to the student, the second dimension as program development information, and the third dimension as measurement and evaluation information. positioned accordingly.

Teachers' Program Proficiency Levels

Regarding the answers given by the teachers to the developed scale, the arithmetic means of the program efficacy perception levels according to the scale dimensions are given in Table 8.

Tablo 8. Arithmetic Means According to Program Proficiency Perception Levels by Scale Dimensions

ITEM NO	ITEM	*N*	*Mean*	*Std. Deviation*
1	When I communicate with my students, I consider their needs.	283	4,52	,554
2	When I communicate with my students, I take their cognitive characteristics into account.	283	4,52	,528
3	When I communicate with my students, I consider their affective characteristics.	283	4,52	,548
4	I can contribute to the development of my students' own ideas.	283	4,49	,598
5	I can create learning environments suitable for my students to develop their critical thinking skills.	283	4,47	,603
6	I can carry out teaching activities collaboratively with my students.	283	4,46	,596
7	I am open to new ideas in the activities we do with my students.	283	4,61	,523
8	I show a guiding attitude towards my students.	283	4,53	,573
9	I prefer to offer a democratic environment to my students instead of being authoritarian in classroom management.	283	4,52	,592
10	I try to create an innovative environment while performing teaching activities.	283	4,48	,609
11	I act impartially when evaluating my students.	283	4,63	,577
F1 TOTAL		283	4,52	,449
12	I think that I am competent in planning activities in accordance with teaching strategies, methods and techniques.	283	4,17	,776
13	I can choose different strategies, methods and techniques that can be used in instructional planning in a way that will achieve the learning outcomes.	283	4,27	,707
14	I feel competent in creating gains related to programs.	283	4,17	,784
15	I feel competent in creating content related to programs.	283	4,17	,761
16	I feel competent in making evaluations about the programs.	283	4,08	,795
17	I can apply the logic of program development in an interdisciplinary context.	283	4,30	,714
18	I am competent in producing national projects with my students.	283	4,17	,843
19	I am competent in producing international projects with my students.	283	4,18	,739
20	I can use skill-oriented teaching approaches suitable for the programs developed for gifted students in my activities.	283	4,19	,767

21	I can produce activities that can develop critical thinking skills in accordance with the programs developed for gifted students.	283	4,18	,759
22	I can produce activities that can develop analytical thinking skills in accordance with the programs developed for gifted students.	283	4,19	,767
23	I can produce activities that can develop innovative thinking skills in accordance with the programs developed for gifted students.	283	4,16	,805
24	I can produce activities that can develop inquiry-based skills in accordance with the programs developed for gifted students.	283	4,17	,809
25	I can produce activities that can develop creative thinking skills in accordance with the programs developed for gifted students.	283	4,01	,913
26	I can effectively implement differentiated instructional programs specific to my gifted students.	283	3,56	1,078
F2 TOTAL		283	4,13	,665
27	I can measure and evaluate my students' readiness levels before starting a new topic.	283	4,31	,669
28	I can use alternative assessment methods and techniques according to the characteristics of my students.	283	4,25	,719
29	I can evaluate the results obtained with the measurement method I have applied by using appropriate analysis techniques.	283	4,04	,824
30	I can use measurement and evaluation techniques suitable for the individual differences of my students.	283	4,23	,767
31	I can use assessment and evaluation techniques suitable for my students' learning.	283	4,25	,704
32	I can give motivating feedback to my students according to the measurement and evaluation results.	283	4,35	,638
33	I can give correct and constructive feedback to the relevant stakeholders according to the measurement and evaluation results.	283	4,30	,672
34	I can rearrange the teaching and learning processes according to the measurement and evaluation results.	283	4,28	,711
35	I can prepare an individualized education plan for each student.	283	4,00	,921
F3 TOTAL		283	4,22	,603
OVERALL TOTAL		283	4,27	,522

As can be seen in Table 8, teachers' perceptions of efficacy regarding the three dimensions of the scale were determined as x=4.27 in total. The general average for the first dimension of the scale was calculated as x=4.52, the general average for the second dimension x=4.13, and the general average for the third dimension x=4.22. When the overall mean between the dimensions is examined, the answers given to the first dimension, the relativity to the student, revealed that the teachers felt themselves “completely sufficient” in this context. Responses to the second dimension, curriculum proficiency, revealed that teachers felt "completely competent" in this context. The answers given to

the third dimension, measurement and evaluation knowledge, revealed that the teachers felt themselves “adequate” in this context.

In the first dimension of the scale, teachers' perceptions of efficacy were determined as x=4.52. In this case, it was revealed that the teachers considered themselves completely sufficient in the dimension and sub-items of "relevance to the student in the program application". When the sub-items of this dimension were examined, it was determined that teachers' perceptions of efficacy were at the highest level for all items. In this dimension, it has been determined that teachers consider themselves sufficient. The 11th item of the scale "I act impartially when evaluating my students (x=4.63)" and the 7th item of the scale "I am open to new ideas in the activities we carry out with my students (x=4.61)" proficiency was at the level of "I am completely competent". Although the 6th item of the scale, "I can carry out teaching activities with my students in cooperation (x=4.46)", has the lowest arithmetic mean in the dimension, an opinion was reported at the level of "I am completely competent". As a result, it was determined that the teachers' proficiency regarding this efficacy dimension was quite good.

In the second dimension of the scale, teachers' perceptions of efficacy were determined as x= 4.13. It has been determined that teachers consider themselves sufficient in the dimension of having knowledge of curriculum development. For the 17th item of the scale, "I can apply the logic of curriculum development in an interdisciplinary context (x=4.30)", and the 13th item of the scale, "I can choose different strategies, methods and techniques that can be used in instructional planning (x=4.27)" their proficiency is "I am completely competent". The 26th item of the scale, "I can effectively apply differentiated education programs specific to my gifted students (x=3.36)", on the other hand, expressed an opinion at the level of "I am sufficient". As a result, it was determined that teachers' perceptions of curriculum efficacy regarding this efficacy dimension were quite good both in terms of educational activities and curriculum development information.

In the third dimension of the scale, teachers' perceptions of efficacy were determined as x= 4.22. In this case, it was revealed that the teachers considered themselves completely sufficient in the dimension of having measurement and evaluation knowledge and its sub-items. When the sub-items of this dimension were examined, it was determined that teachers' perceptions of efficacy were at the highest level for all items. When the sub-items of this dimension were examined, it was determined that teachers' perceptions of efficacy were at the highest level for all items. In this dimension, it has been determined that teachers consider themselves sufficient. “I can measure and evaluate the readiness level of my students before starting a new topic (x=4.31)”, which is the 27th item of the scale, and “I can give correct and constructive feedback to the relevant stakeholders according to the measurement and evaluation results, which is the 33rd item of the scale.(x=4,30) expressed an opinion at the level of "I am completely competent". The 35th item of the scale is “I can prepare an

individualized education plan specific to each student. (x=4.00)", on the other hand, expressed an opinion at the level of "I am sufficient". As a result, it was determined that teachers' perceptions of curriculum efficacy regarding this efficacy dimension were quite good both in terms of educational activities and curriculum development information.

Comparison of Teachers' Perceptions of Efficacy by Gender

Comparison tests were conducted to determine whether the program efficacy perceptions of teachers educatinggifted students differ according to the gender variable. The Mann Whitney-U Test, one of the non-parametric tests, was used to compare the efficacy perceptions of the teachers, since the data distribution was not normal. The statistics obtained as a result of the test are shown in Table 9.

Table 9. The Results of the Mann Whitney-U Test Compared According to the Gender of theTeachers

	Gender	N	MeanRank	Sum of Ranks	*U*	*p*
FACTOR1	Woman	144	150,08	21611,00	8845,000	,087
	Man	139	133,63	18575,00		
FACTOR2	Woman	144	140,49	20231,00	9791,000	,752
	Man	139	143,56	19955,00		
FACTOR3	Woman	144	143,15	20613,00	9843,000	,809
	Man	139	140,81	19573,00		
TOTAL	Woman	144	144,54	20813,50	9642,500	,595
	Man	139	139,37	19372,50		

As can be seen in Table 9, according to the Mann Whitney U Test result, teachers' Factor 1 (U=8845,000 p>.05) , Factor 2 (U=9791,000 p>.05) , Factor 3 (U=9642,500 p>. 05). It was also analyzed that there was no significant difference between the total scores of the teachers according to the gender variable (U=9642,500 p>.05), and it was determined that there was no significant difference in the teachers' perceptions of efficacy in this regard.

Comparison of Teachers' Perceptions of Efficacy by Age

Comparison tests were conducted to determine whether the efficacy perceptions of teachers educatinggifted students differ according to the age variable. The Kruskal Wallis H Test, one of the non-parametric tests, was used to compare the efficacy perceptions of the teachers, since the data distribution was not normal. The statistics obtained as a result of the test are shown in Table 10.

Table 10. Kruskal Wallis-H Test Results Compared According to the Ages of the Teachers

	Age	N	MeanRank	df	H	p
FACTOR1	26-30	23	139,33	5	5,210	,391
	31-35	49	147,85			
	36-40	65	131,40			
	41-45	78	134,54			
	46-50	46	151,76			
	51-55	22	169,14			
FACTOR2	26-30	23	129,26	5	1,861	,868
	31-35	49	134,74			
	36-40	65	143,78			
	41-45	78	148,99			
	46-50	46	138,01			
	51-55	22	149,80			
FACTOR3	26-30	23	152,72	5	1,249	,940
	31-35	49	146,79			
	36-40	65	134,65			
	41-45	78	140,99			
	46-50	46	140,71			
	51-55	22	148,14			
TOTAL	26-30	23	137,22	5	,729	,981
	31-35	49	141,05			
	36-40	65	139,93			
	41-45	78	142,88			
	46-50	46	140,49			
	51-55	22	155,25			

When Table 10 is examined, the results of the Kruskal-Wallis H Test among the teachers' Factor 1 (H=5,210 p>.05), Factor 2 (H=1,861 p<.05), Factor 3 (H=,729 p>.05) scores, it was analyzed that there was no significant difference according to the age variable (U=8845,000 p>.05) and as a result, it was determined that there was no significant difference in teachers' perceptions of efficacy. As a result of the Kruskal-Wallis H Test, it was analyzed that there was no significant difference between the total scores of the teachers according to the age variable (H=,729 p>.05). According to this result, it was examined whether teachers' perceptions of efficacy for the education of gifted students changed for the total scores of the scale, and as a result, it was determined that there was no significant difference in teachers' efficacy perceptions.

Comparison of Teachers' Perceptions of Efficacy Through Disciplines

Comparison tests were conducted to determine whether the efficacy perceptions of teachers educatinggifted students differ according to the branch variable. The Kruskal-Wallis H Test, one of the non-parametric tests, was used to compare the efficacy perceptions of the teachers, since the data distribution was not normal. The statistics obtained as a result of the test are shown in Table 11.

Table 11. The Results of the Kruskal Wallis-H Test Compared According to the Disciplines of the Teachers

	Disciplines	N	MeanRank	df	H	p
FACTOR1	ICT	14	127,46			
	Biology	16	167,50			
	Geography	12	110,42			
	Philosophy	15	163,03			
	Literature	15	134,77			
	Science	15	127,40			
	Physics	15	142,57			
	Art	14	154,14			
	Elementary School Maths	15	122,67			
	Chemistry	13	93,12	18	23,456	,174
	High School Maths	15	102,83			
	Music	16	160,03			
	Counselling	15	137,27			
	Elementary School Teaching	14	158,14			
	SocialScience	15	188,73			
	History	15	127,37			
	Technology Design	15	148,87			
	Turkish	16	147,13			
	Foreign Language	18	164,83			
FACTOR2	ICT	14	143,21			
	Biology	16	161,00			
	Geography	12	128,33			
	Philosophy	15	140,07			
	Literature	15	113,83	18	20,369	,312
	Science	15	131,87			
	Physics	15	159,67			
	Art	14	163,64			
	Elementary School Maths	15	140,03			

	Chemistry	13	82,00			
	High School Maths	15	119,87			
	Music	16	158,25			
	Counselling	15	115,20			
	Elementary School Teaching	14	137,64			
	SocialScience	15	182,40			
	History	15	143,97			
	Technology Design	15	153,67			
	Turkish	16	146,41			
	Foreign Language	18	161,00			
FACTOR3	ICT	14	130,39			
	Biology	16	151,94			
	Geography	12	108,29			
	Philosophy	15	132,73			
	Literature	15	118,20			
	Science	15	124,50			
	Physics	15	163,80			
	Art	14	171,93			
	Elementary School Maths	15	118,83			
	Chemistry	13	103,92			
	High School Maths	15	121,77			
	Music	16	173,72			
	Counselling	15	160,00			
	Elementary School Teaching	14	154,14	18	17,836	,466
	SocialScience	15	159,17			
	History	15	143,90			
	Technology Design	15	136,40			
	Turkish	16	149,44			
	Foreign Language	18	158,56			
TOTAL	ICT	14	134,46			
	Biology	16	161,00			
	Geography	12	117,17			
	Philosophy	15	146,77			
	Literature	15	118,57	18	20,957	,282
	Science	15	130,47			
	Physics	15	158,53			
	Art	14	165,00			
	Elementary School Maths	15	131,23			

	Chemistry	13	82,69
	High School Maths	15	112,60
	Music	16	167,16
	Counselling	15	134,43
	Elementary School Teaching	14	150,61
	SocialScience	15	182,27
	History	15	132,77
	Technology Design	15	145,00
	Turkish	16	151,44
	Foreign Language	18	157,83

When Table 11 is examined, as a result of the Kruskal-Wallis H Test performed, the teachers' Factor 1 (H=23.456 p>.05), Factor 2 (H=20.369 p>.05), Factor 3 (H=17,836 p>.05) scores differ between branches. It was determined that there was no significant difference according to the variable of the teacher and as a result, it was determined that there was no significant difference in teachers' perceptions of efficacy. As a result of the Kruskal-Wallis H Test, it was determined that there was no significant difference between the teachers' total scores according to the branch variable (H=20-957 p>.05). It was determined that there was no significant difference in teachers' efficacy perceptions by looking at whether the perceptions of teachers' efficacy towards the education of gifted students according to their branches changed for the total scores of the scale.

Comparison of Efficiency Perceptions of Teachers According to Their Working Period in the Proffession

Comparison tests were conducted to determine whether the efficacy perceptions of teachers educatinggifted students differ according to the variable of working time in the profession. The Kruskal-Wallis H Test, one of the non-parametric tests, was used to compare the efficacy perceptions of the teachers, since the data distribution was not normal. The statistics obtained as a result of the test are shown in Table 12.

Table 12. The Results of the Kruskal Wallis-H Test, Which is Compared According to the Working Time of the Teachers in the Profession

	Working Time of Profession	N	MeanRank	df	H	p
FACTOR1	0-5 years	17	173,71			
	6-10 years	49	151,18			
	11-15 years	61	123,55	4	7,112	,130
	16-20 years	72	137,14			
	21 yearsandover	84	147,79			
FACTOR2	0-5 years	17	155,03	4	4,399	,355

	6-10 years	49	132,76			
	11-15 years	61	129,77			
	16-20 years	72	155,49			
	21 yearsandover	84	142,08			
FACTOR3	0-5 years	17	171,29			
	6-10 years	49	152,77			
	11-15 years	61	130,10	4	4,487	,344
	16-20 years	72	141,28			
	21 yearsandover	84	139,05			
TOTAL	0-5 years	17	163,12			
	6-10 years	49	141,54			
	11-15 years	61	129,14	4	3,170	,530
	16-20 years	72	148,96			
	21 yearsandover	84	141,37			

When Table 12 is examined, as a result of the Kruskal-Wallis H Test, the scores of the teachers in Factor 1 (H=7.112 p>.05), Factor 2 (H=4.399 p>.05), Factor 3 (H=4.487 p>.05), It was determined that there was no significant difference according to the variable of working time, and as a result, it was determined that there was no significant difference in teachers' perceptions of efficacy. As a result of the Kruskal-Wallis H Test, it was determined that there was no significant difference between the total scores of the teachers according to the variable of working time in the profession (H=3,170 p>.05). It was examined whether the teachers' perceptions of efficacy for the education of gifted students according to their working time in the profession changed for the total scores of the scale, and as a result, it was determined that there was no significant difference in the efficacy perceptions of the teachers.

Comparison of Teachers' Perceptions of Competence with Gifted Students According to Working Time

Comparison tests were conducted to determine whether the efficacy perceptions of teachers educatinggifted students differ according to the variable of working time with gifted students. The Kruskal-Wallis H Test, one of the non-parametric tests, was used to compare the efficacy perceptions of the teachers, since the data distribution was not normal. The statistics obtained as a result of the test are shown in Table 13.

Table 13. The Results of the Kruskal Wallis-H Test, Which is Compared According to the Working Time of the Teachers with the Gifted

	Working years with gifted	N	MeanRank	*df*	*H*	*p*	Beforonni Post-Hoc testi
FACTOR1	0-5 years	201	137,82				
	6-10 years	51	155,19				
	11-15 years	18	131,19	4	3,968	,410	
	16-20 years	10	164,40				
	21 years and over	3	188,33				
FACTOR2	0-5 years	201	133,93				
	6-10 years	51	175,81				0-5 yıl/6-10 years
	11-15 years	18	124,89	4	14,113	,007	6-10 years/11-15 years
	16-20 years	10	139,85				
	21 years and over	3	217,83				
FAKTÖR3	0-5 years	201	141,38				
	6-10 years	51	156,18				
	11-15 years	18	106,94	4	6,193	,185	
	16-20 years	10	130,55				
	21 years and over	3	191,00				
TOPLAM	0-5 years	201	136,37				
	6-10 years	51	166,14				
	11-15 years	18	121,86	4	8,193	,085	
	16-20 years	10	150,50				
	21 years and over	3	201,67				

When Table 13 is examined, it has been determined whether there is a significant difference between the scores of the teachers' Factor 1 (H=3.968 p>.05) and Factor 3 (H=8,193 p>.05) as a result of the Kruskal-Wallis H Test, according to the variable of working time with gifted students. As a result, it was determined that there was no significant difference in teachers' perceptions of efficacy. In addition, it was determined that there was a significant difference between the Factor 2 scores of the teachers according to the variable of working time with gifted students (H=14,113 p<.05).The data were analyzed with the Kruskal-Wallis H Test, one of the non-parametric tests, in order to see whether the teachers' perceptions of proficiency in curriculum knowledge change according to the duration of educatinggifted students, and as a result, it was determined that there was a significant difference in teachers' efficacy perceptions. As a result of the Borferoni Post-hoc test performed to determine between which groups this difference is, between 0-5 years and 6-10 years; It has been determined that there is a significant difference in the efficacy perceptions of students between the

special talents between 6-10 years and 11-15 years and their working time. In terms of significant difference, the comparison between 0-5 years and 6-10 years is in favor of 6-10 years.

As seen in the table, when the mean rank is examined, it is seen that the mean rank for 6-10 years (S.O.= 175.81) is higher than the mean rank for 0-5 years (133.93). In terms of significant difference, the comparison between 6-10 years and 11-15 years is in favor of 6-10 years. As can be seen in the table, when the mean rank is examined, it is seen that the mean rank for 6-10 years (S.O.= 175.81) is higher than the mean rank for 11-15 years (124.89). It was determined that there was no significant difference for the total scores of the teachers according to the variable of working time with the gifted students (H=8,193 p>.05). According to the duration of educatinggifted students, it was examined whether teachers' perceptions of efficacy for the education of gifted students changed for the total scores of the scale, and as a result, it was determined that there was no significant difference in teachers' efficacy perceptions.

Discussion, Conclusion and Recommendations

In line with the research problems in the study, a scale consisting of "curriculum development knowledge", "applicability according to the student" and "assessment-evaluation knowledge" sub-dimensions and 35 items was developed in order to collect data on the perception of program efficacy of teachers educatinggifted students. As a result of the exploratory factor analysis, three factors explained 66.70% of the total variance in the entire scale. The Cronbach Alpha (α) reliability coefficient of the scale was calculated as .963 for the 1st dimension, .936 for the 2nd dimension, .935 for the 3rd dimension and .972 for the whole scale, and it was determined that the scale was highly reliable. Chi-square (x2= 2.985, sd= 550 ,p=0.00) value was found to be significant in the confirmatory factor analysis performed to confirm the three-factor structure of the scale. The fit index values were found as RMSEA= .072, NFI= .89, CFI= .92, IFI= .92, RFI= .90, GFI= .90, SRMR= .025. In the study, it was concluded that the scale developed to determine the efficacy perceptions of teachers educatinggifted students in the context of special curriculum development and to collect data in the research is reliable and that reliable data can be collected in this context.

The scale, which was developed for the perception of curriculum efficacy of the teachers of gifted students, was applied to a different group of teachers in order to collect data in line with the sub-problems of the research. It was observed that teachers' perceptions of efficacy in all three dimensions of the scale did not make a significant difference according to gender, age, branch and working time in the profession. However, when teachers' working time with gifted students is examined, there is no difference in their efficacy perceptions related to student relevance and measurement-evaluation dimensions, while there is a difference in favor of teachers who have worked between 6-10 years in the dimension of program efficacy perception.

It can be said that this situation is due to the fact that the teachers get used to the gifted in the first 5 years, they try to dominate the literature in the field of the gifted, and it covers the period of reaching a sufficient level in the context of practice. It can be said that teachers who have gained sufficient experience between 6-10 years can now be an indication that they can apply the knowledge and practices learned in the theoretical context about gifted people professionally and in a way that will make a difference. Therefore, teachers educatinggifted students need to have experience educatingthese students for a certain period of time in order to gain content knowledge proficiency.

According to Metin (1999), educatinggifted children is an interesting, exciting and enjoyable occupation, but teachers who will work with these children must have strong equipment in terms of their professional formations and have certain personality traits. The fact that gifted children are different from other children in terms of their interests, speed and depth of learning, and enrichment of teachers in curriculum planning, implementation and evaluation in the classroom environment, etc. requires some precautions. In this context, it is necessary to have a program development logic specific to the student or student group, focused on differentiation and enrichment by spending a certain time with these students and gaining experience in line with their needs. The opinions of Rogers (1989) about having professional experience for a certain period of time and accepting the results obtained from the experiences during this period as an important criterion in the selection of teachers who will train gifted children also differed in the change of the program efficacy perception dimension of this study according to the duration of study. This finding shows that this result is also supported in the context of the literature. Seeley (1998) conducted a study on the competencies of teachers educatinggifted students, with high cognitive teaching and inquiry; curriculum revision strategies; specific curriculum creation strategies; concluded that diagnostic methodological teaching skills and student counseling strategies were highly important. As can be seen among the factors that are important and make a difference, the items on curriculum development information are concentrated.

As a result, it is seen that the factors of age, branch, gender and working time of teachers educatinggifted students do not have much effect on teachers' perception of program proficiency, but they are an important factor on the dimension of program proficiency on the duration of educatinggifted students. It is thought that the scale, which measures the general curriculum efficacy perception of teachers who work with gifted students or who will be candidates to work, and which is more related to the education process, will have an important place in terms of national and international literature. A low score from the scale indicates that teachers' perceptions of curriculum efficacy can be improved, while a high score indicates that teachers' perceptions of curriculum efficacy will be sufficient. In this context, in line with the results obtained, it can be accepted as a status statement about teachers educatinggifted students and, if necessary, supportive trainer trainings can be given by the Ministry of National Education and relevant institutions.

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