

# Investigation of Science Teachers' Perceptions of Multicultural Education and Perceptions of Competence for Multicultural Education \*

## Fen Bilimleri Öğretmenlerinin Çokkültürlü Eğitime Yönelik Algılarının ve Çokkültürlü Eğitim Yeterlilik Algılarının İncelenmesi

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**Öz:** Bu çalışmanın amacı, Türkiye'deki ortaokul fen bilimleri öğretmenlerinin çokkültürlü eğitime ilişkin algılarını ve yeterlilik algılarını incelemektir. Araştırma karma yöntemin açıklayıcı deseni ile yürütülmüştür. Fen bilimleri öğretmenlerinin çokkültürlü eğitime ilişkin algı ve yeterlilik algılarını belirlemek için Çokkültürlü Yeterlilik Algıları Ölçeği ve Çokkültürlü Eğitim Algı Ölçeği ile nicel veriler toplanmıştır ve araştırmaya farklı demografik özelliklere sahip 204 fen bilgisi öğretmeni katılmıştır. Analizlere göre, yaş ve deneyim bakımından daha büyük olan fen öğretmenlerinin çokkültürlü eğitim algısı ve yeterlilik algısı diğer öğretmenlere göre daha yüksektir. Ayrıca bulgular, öğretmenlerin çokkültürlü eğitim hakkında bilgi sahibi oldukça, çokkültürlü eğitimle ilgili yeterlilik algılarının desteklenebileceğini göstermektedir.

**Anahtar Kelimeler:** çokkültürlü eğitim, çokkültürlü fen eğitimi, çokkültürlü eğitim algısı, çokkültürlü eğitim yeterlilik algısı

**Abstract:** The purpose of this study is to examine the perceptions and perception of competencies of secondary school science teachers in Turkey regarding multicultural education. The study was conducted with the explanatory design of mixed methods. Quantitative data were collected with the Multicultural Competence Perceptions Scale and the Multicultural Education Perceptions Scale to determine science teachers' perceptions and perception of competencies regarding multicultural education, and 204 science teachers with different demographic characteristics participated in the study. According to the analysis, science teachers who were older in terms of age and experience had higher perceptions of multicultural education and perception of competencies than other teachers. In addition, the findings suggest that as teachers gain knowledge about multicultural education, their perception of competencies related to multicultural education can be supported.

**Keywords:** multicultural education, multicultural science education, perception of multicultural education, competence of multicultural education

### Introduction

In recent years, many children in Turkey have been denied the right to education for various reasons. In particular, students living in rural areas, girls in some regions, children with insufficient socio-economic status and learning disabilities, refugees, seasonal workers, and those who came to Turkey through forced migration are deprived of the right to education (Çiftçi, 2019). Individuals who are deprived of this fundamental right have difficulty in gaining a place in society and having a voice. According to the 2017-2018 Education Monitoring Report, Turkey has the highest rate of early school leaving in Europe with 31% for boys and 34% for girls (Education Reform Initiative [ERI], 2018). Generally, students leave their education early due to economic conditions for boys and early marriage for girls. When girls and boys are compared, it is stated in the 2014-2015 Education Monitoring Report that although the gap between the schooling rates of

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girls and boys is gradually closing, the differentiation on the basis of regions continues. At the secondary education level, girls' enrollment rates are lower than boys' (Education Reform Initiative [ERI], 2015). In the 2017-2018 academic year in Turkey, the net enrollment rate in primary education was above 90%, but the enrollment rate in secondary education has not yet reached 90%, despite an increase compared to the previous year (Education Reform Initiative [ERI], 2018).

On the other hand, Turkey is a country of migration movements due to its geographical location and social structure and has experienced mass migration movements for various reasons in recent years (Çiftçi, 2019). In 2021, Turkey hosted 3.6 million Syrian refugees (United Nations High Commissioner for Refugees, [UNHCR], 2021). This number increased to 4 million in 2022 (United Nations High Commissioner for Refugees, [UNHCR], 2022). According to TÜİK (2023) data, 739,364 people migrated to Turkey from abroad and among these migrants, Iraqi citizens took the first place with 12.1% of the foreign population coming to Turkey in 2021. Iraq was followed by Iran with 10.9%, Uzbekistan with 6.5%, Syria with 6% and Afghanistan with 5.5%. Although we think that refugee children are receiving education, many still do not have access to adequate education. According to the 2017-18 Education Monitoring Report, despite a 62% increase in the schooling rate compared to the previous year, 407,906 Syrian children still do not have access to education (Education Reform Initiative [ERI], 2018). Every child has the right to education regardless of language, religion or race. In addition to lack of access to education, there are also problems experienced while receiving education. At this point, the teacher who has a good command of multicultural education and different cultures should play an active role. By respecting the student's differences such as language, religion, race, opinion, social status, etc., the teacher should acclimatize the student to the class, to his/her friends and help him/her in all matters. In the same way, teachers should teach other students in the class to respect different cultures and differences. For this reason, the concept of multiculturalism is an issue that teachers, administrators and other school staff should be aware of. Within the scope of this study, multicultural education perceptions and multicultural education efficacy perceptions of science teachers working in public and private secondary schools in Turkey were examined, and it was planned to provide concrete recommendations to policy makers, educators and researchers.

### **Purpose and Significance of the Research**

According to the Education Reform Initiative's Reducing Inequality in Education Project - Turkey National Report (ARISE, 2021), immigration status has an impact on the education students receive and there are more than four million people with immigrant status in Turkey. It is also known that the majority of families with immigration status have low socioeconomic status (ARISE, 2021), which indirectly affects the quality of education. Migrant students are not only disadvantaged in terms of language, but factors such as gender and ethnicity can also complicate their integration. One of the ways to overcome these difficulties is for teachers to have a positive perception of multiculturalism and to be competent in multicultural education. However, there are very few studies examining the perceptions and perception of competencies of in-service science teachers in Turkey towards multicultural education. Marangoz's (2014) study examining the perceptions of school administrators and teachers towards multicultural education can be given as an example. However, the focal point of this study is not science teachers. Therefore, there was a need for a study on this subject. When the studies are examined, it is seen that there are studies on multiculturalism in the fields of language teaching or social science, but there is little association with science. Since it may be difficult to associate multiculturalism with science or mathematics, it is thought that there are few studies on this subject.

Based on this need, this study aims to examine the perceptions and perception of competencies of science teachers working in private and public secondary schools about multicultural education. When the literature is examined, it is seen that the concept of multiculturalism includes variables such as age, gender, socioeconomic index (Banks, 2013). The research questions were

determined by predicting that teachers' working conditions, experiences and cultural characteristics may affect their perceptions towards multicultural education. The research questions determined in this context are as follows;

1. Do science teachers' perceptions of multicultural education differ according to age, gender, type of school, school location, educational background and professional experience variables?
2. Do science teachers' perceptions of competence in multicultural education differ according to age, gender, type of school, school location, educational background and professional experience variables?
3. Is there a statistically significant relationship between science teachers' perceptions of multicultural education and their perceptions of competence regarding multicultural education?
4. How are science teachers' perceptions on multicultural education and how are these perceptions reflected in the classroom environment?

It is thought that the findings of the study will provide concrete evidence for school administrators, researchers, policy makers and teachers.

### **Theoretical and Empirical Background**

The concept of multicultural education is difficult and complex to define, so no single definition of multicultural education has been established (Heber, 2020). However, there is almost universal agreement on some of the main goals of multicultural education (Heber, 2020) and some basic dimensions for multicultural education have been defined. According to Banks (1995), five dimensions can be identified for multicultural education; these are content integration, knowledge construction process, prejudice reduction, equity pedagogy, empowering school culture and social structure. Content integration deals with the extent to which teachers use examples, data, and information from diverse cultures and groups to illustrate key concepts, generalizations, principles, and theories in their subject area or discipline (Banks, 1995). The knowledge construction process describes the procedures by which social, behavioral and natural scientists construct knowledge and how cultural assumptions, frames of reference, perspectives and biases within a discipline influence the ways in which knowledge is constructed within the discipline (Banks, 1995; Gould, 1981; Harding, 1991). The prejudice reduction dimension of multicultural education identifies the characteristics of children's racial attitudes and strategies that can be used to help students develop more democratic attitudes and values (Banks, 1995). Equity pedagogy emphasizes teachers' use of techniques and methods that facilitate the academic achievement of students from different racial, ethnic and social class groups (Banks, 1995). Thus, every student has the chance to learn the same subject matter in a way that considers their differences. For an empowering school culture and social structure, it is used to describe the process of restructuring the culture and organization of the school so that students from different racial, ethnic and social class groups experience educational equality and cultural empowerment (Banks, 1995). Although the concept of multicultural education is complex, these basic goals and dimensions help to overcome this complexity. In this way, multicultural education becomes understandable to everyone and can be given due importance.

Banks defined it as multicultural education because the changes that occur in education in order to provide multicultural education consist of a reform movement, idea and process (Banks, 2013). It is an educational reform that is carried out regardless of differences such as language, religion and race in order to ensure that students benefit from education in an equal and fair way (Banks, 2013). In addition, multicultural education advocates that individuals have the right to receive equal education regardless of the culture they belong to (Aydın, 2013). Through multicultural education, students not only learn the concepts of equality and justice, but also learn that different cultures can live together in peace. The aim of multicultural education is to provide equal opportunities for all learners to benefit from the knowledge and experience of all learners and teachers. Yılmaz (2016) conducted a qualitative research with 12 Turkish pre-service teachers to determine their perceptions of multiculturalism and multicultural education. The findings of the

study showed that pre-service teachers had a positive perspective towards the concept of multiculturalism. The results also revealed that pre-service teachers were aware of the responsibilities of pre-service teachers in the development of multicultural education. Similarly, Gezer (2018) examined the relationship between the educational philosophy adopted by Turkish pre-service teachers and their attitudes towards multicultural education. She reported that there was a moderate negative correlation between attitude towards multicultural education and modern philosophy of education, while there was a positive correlation between postmodern philosophy of education and attitude towards multicultural education. The findings obtained through regression analysis show that 40% of pre-service teachers' attitudes towards multicultural education are explained by the educational philosophies they adopt. These findings reveal that teacher education plays a key role in the development of multicultural education.

Multicultural science education is defined as a research area that aims to provide students with the appropriate environment and opportunity to learn quality science (Atwater & Riley, 1993; Luft et al., 1999). Although science educators agree with the idea of providing opportunities for quality science, there are different opinions about what kind of work should be done in the classroom. It is very important to value fairness and equitable science education in science classes (Atwater, 1996). In addition, teachers should appreciate and encourage all children's ideas when discussing topics in the classroom (Matthews, 1998). If international acceptance and validation of science education are to be achieved, NSTA must work with other professional organizations, institutions, companies, and agencies to seek the resources necessary to provide science education for all students. To achieve this, NSTA adheres to the following principles:

- Schools should provide science education programs that nurture all children academically, physically and in developing a positive self-concept;
- Children from all cultures should have equal access to quality science education experiences that promote achievement and provide them with the knowledge and opportunities to become successful participants in a democratic society;
- Curriculum content should incorporate the contributions of many cultures to science knowledge;
- Science teachers should be knowledgeable about and use culturally relevant learning and teaching practices;
- Science teachers have a responsibility to engage culturally diverse children in science, technology and engineering career opportunities; and
- Instructional strategies chosen for use with all children should recognize and respect the differences that students bring based on their own culture (NSTA, 2020).

Science education focuses on constructing new knowledge based on students' prior learning and experiences (Gay, 2002). Students' prior learning and experiences are part of cultural diversity. However, there is a misconception that science education should be inherently culture-neutral (Laughter & Adams, 2012). In contrast to this view, Kim et al. (2021) found that culturally relevant pedagogy in a project-based science classroom enhanced student engagement and science understanding.

### **Method**

The research was conducted with the explanatory design of the mixed method. In this design, the steps of first collecting and analyzing quantitative data and then examining them in detail with qualitative data are followed. This method was used to clarify and deepen the relationships between variables. Quantitative data were collected with the Multicultural Competence Perceptions Scale and Multicultural Education Perception Scale to determine the perceptions and perception of competencies of science teachers regarding multicultural education. In line with the quantitative data collected, interview questions were applied to the teachers. The convenient

sampling method was used to determine participants. Science teachers who could be reached and then new participants obtained by snowballing technique constituted the sample of the study.

### Sampling

Demographic information of the 204 teachers who participated in the study is presented in Table 1. When we look at the provinces where teachers work, Istanbul, Ankara and Mersin are the provinces with the highest number of participants. Following these provinces, teachers work in Batman, İzmir, Hatay, Diyarbakır, Bursa, Kayseri, Konya, Kırşehir, Antalya, Kırıkkale, Afyonkarahisar, Ağrı, Düzce, Gaziantep, Malatya, Nevşehir, Balıkesir, Denizli, Elazığ, Kahramanmaraş, Karabük, Karaman, Kastamonu, Mardin, Ordu, Sakarya, Siirt, Uşak, Çorum, Şanlıurfa and Şırnak. When the number of Syrian students in some provinces is evaluated according to the data obtained from e-school and YÖBİS systems; 26,660 in İzmir, İstanbul 118,391, Ankara 20,466, Mersin 37,000, Batman 2,590, Hatay 71,543, Diyarbakır 4,708, Bursa 35,791, Kayseri 15,920, Konya 23,113, Antalya 6,684, Gaziantep 97,861, Malatya 7.206, Kahramanmaraş 24,745, Mardin 10,800, Sakarya 3,068, Çorum 586, Şanlıurfa 66,956 Syrian students (MoNE, 2022). In order to draw deeper inferences from the results obtained after the analysis of the quantitative data, interviews were conducted with volunteer teachers working in schools where multicultural education is intensively used (refugee students) and where multiculturalism is culturally important (ethnic differences). Interviews were conducted with 10 volunteer teachers. The volunteer science teachers interviewed were between the ages of 26 and 60 and all of them were ethnically Turkish. Multiculturalism includes the broad scope of race, ethnicity, language, sexual orientation, gender, age, disability, class status, education, religious/spiritual orientation, and other cultural dimensions (APA, 2002). These are all critical aspects of an individual's ethnic/racial and personal identity (APA, 2002). Multiculturalism, which provides an equal, respectful, sensitive and tolerant approach without discrimination in terms of language, race, religion, gender, abilities, socioeconomic status, disabilities, age, social class and other differences, is defined as the coexistence of many different cultures (Ekşi, 2020). For these reasons, ethnicity and race are important. The fact that the selected teachers are also from different ethnic origins is important for the diversity of the research and accurate results. 5 participants had bachelor's degrees, 4 participants had master's degrees and 1 participant was continuing his/her doctorate education. Five of the participants worked in public and five in private schools and had between 1.5 and 40 years of experience. Eight of the teachers work in the city center and two in the district center. Five teachers have worked with foreign students and have between 4 months and 4 years of experience. The other 5 teachers have not worked with foreign students.

**Table 1**

#### *Demographics*

		<i>f</i>	%
Gender	Male	45	22.1
	Female	159	77.9
Ethnicity	Turkish	167	81.9
	Kurdish	17	8.3
	Others (9)	20	9.8
Age range	22-27	37	18.1
	28-33	68	33.3
	34-39	56	27.5
	40-45	29	14.2
	46-51	9	4.4
	52+	5	2.5

Educational Background	Undergraduate	148	72.5
	Master's Degree	53	26.0
	PhD	3	1.5
Professional Experience	0-5	60	29.4
	6-11	63	30.9
	12-17	39	19.1
	18-23	30	14.7
	24-29	11	5.4
	30+	1	0.5
Type of School	Public School	98	48.0
	Private School	106	52.0
School Location	Town	9	4.4
	Village / Rural	19	9.3
	District	44	21.6
	City	132	64.7

### **Data Collection Process**

The quantitative measurement tools determined within the scope of the research were delivered online to the science teachers who voluntarily participated in the research and the data collection process lasted four months. The two scales used were given to the participants together. After the application of the scales, semi-structured interviews were conducted with volunteer science teachers to obtain their views on multiculturalism. The semi-structured interviews were conducted individually online and recorded. In this study, permission was first obtained from Hacettepe University Ethics Committee (05.24.2022 / E-35853172-300-00002204002) and the data (NE collection process started after the teachers approved the voluntary participation forms.

### ***Multicultural Education Perception Scale (MEPS)***

The "Multicultural Education Perception Scale" (MEPS) developed by Marangoz (2014) was examined to determine the perceptions and awareness of science teachers regarding multicultural education and the scale was used in the research. The scale developed by Marangoz (2014) was prepared to be applied to teachers and school administrators. For this study, it was used to be applied to science teachers. The first part of the scale is titled general information. In this section, data on gender, ethnicity, age, educational status, position in the organization and working time were collected from the participants. In the second part, there are 20 five-point Likert-type items about perceptions of multicultural education and they are rated as "Strongly Disagree (1)", "Disagree (2)", "Partially Agree (3)", "Agree (4)" and "Strongly Agree (5)". Cronbach Alpha internal consistency coefficient of the scale was reported as 0.90. The necessary permissions were obtained for the use of the scale within the scope of the research. For this study, the reliability analysis for the overall Multicultural Education Perception Scale was repeated and the calculated Cronbach Alpha internal consistency coefficient was found to be  $\alpha = .796$ .

### ***Multicultural Education Competence Perceptions Scale (MECPS)***

In order to determine the perception of competencies of science teachers regarding multiculturalism, the "Multicultural Education Competence Perceptions Scale" (MECPS) developed by Çiftçi (2015) was used. The scale consists of 58 items in five-point Likert scale and is graded as "Strongly Disagree (1)", "Disagree (2)", "Partially Agree (3)", "Agree (4)" and "Strongly Agree (5)". The Cronbach Alpha internal consistency coefficient of the scale was reported as 0.85. For this study, the reliability analysis for the overall Multicultural Competence Perception Scale was repeated and the calculated Cronbach Alpha internal consistency coefficient was found to be  $\alpha = .855$ . In addition to the two scales used, 10 science teachers were interviewed to collect qualitative data. The interview form developed by Uyanık (2015) was used to determine

the views of science teachers on multiculturalism. The interview questions were developed in accordance with the steps of Banks' four-stage multicultural transformation approach: knowing, sensing, transformation and taking action (Uyanık, 2015). The necessary permissions were obtained for the use of the scale within the scope of the research.

### ***Interview Form***

Within the scope of the research, the 'Interview Form' developed by Uyanık (2015) was used to determine the views of science teachers on multiculturalism. The necessary permissions were obtained to use the scale within the scope of the research. Uyanık (2015) prepared the interview questions by considering the steps of the transformation approach in Banks' four-stage multicultural approach. These steps are knowledge, perception, transformation, and action. While preparing the questions, 6 people were selected by Uyanık (2015) from 66 participants working in Antalya province, paying attention to the fact that they were similar in terms of socio-economic levels, ages, years of working in the profession but came from different provinces and cultures, and the interviews lasted 40 minutes. Based on these preliminary interviews and data, Uyanık (2015) finalized the semi-structured interview form by eliminating similar and unclear interview questions and then asked the participants for their opinions on the structure and content of the questions. The expert opinion of a faculty member was taken by Uyanık (2015) about the revised questions. The interview form first includes personal information such as gender, age, educational background, teaching background. The next part includes questions about multicultural education. These questions were directed by the researcher to the science teachers who could be reached and who wanted to participate in the study. The interview form developed by Uyanık was applied by the researcher to 10 participants in this study, and each interview lasted 30 minutes approximately. The ages, educational levels, and types of schools of teachers differed. 50% of the participants have worked with foreign students, such as Syrians. The interview questions aimed to support the quantitative data obtained from the teachers. In this way, the opinions of the teachers and the answers given to the scales were explained in detail. In addition to the two scales used in the study, interviews were conducted with pre-service science teachers to collect qualitative data. The interview questions are given in the appendices (Appendix 1). Quantitative data collection tools aim to elaborate and support quantitative data with qualitative interviews by asking multiculturalism perceptions of science teachers and multicultural eBu interview questions.

### **Data Analysis**

T-Test and ANOVA were used to test whether the scores of the teachers who participated in the study differed according to the demographic characteristics of graduation, age, and experience. The source of the difference obtained in demographic characteristics with more than one sub-dimension was determined using posthoc tests (Tukey, Bonferroni, and Scheffé). Pearson correlation values were examined to determine whether there was a statistically significant relationship between the scores that teachers received from the tests. Before starting the analysis, it is necessary to test whether the distribution of the data set is normal. For this purpose, normality tests were applied and the distributions of the data were analyzed. Qualitative data were analyzed by content analysis method. For qualitative data, open-ended questions were asked to the participants and the questions were analyzed to determine teachers' thoughts and knowledge about multicultural education. Teachers were coded and named and detailed interpretation was made based on the themes in the questions.

For the reliability analysis of the qualitative data, a sample was selected from the data set. This sample was coded by the researcher and two field experts in the field of science teaching. The reliability between the coders was found to be 87%. For qualitative data, in line with the answers given by the teachers about multicultural education, coding was made as I know multiculturalism, I feel competent in this regard, I can create a multicultural curriculum.

### Findings

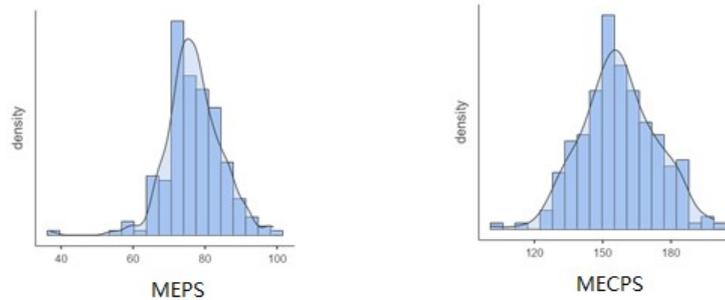
In this part of the study, the results of the analysis of the Multicultural Education Perception Scale and Multicultural Competence Perception Scale according to different variables are presented. These variables are gender, age, school type, location, educational status and experience. Descriptive analysis results for the Multicultural Education Perception Scale and Multicultural Competence Perception Scale for the sample are presented in Table 2.

**Table 2**  
*Descriptive Statistics*

	MEPS	MECPS
N	204	204
Mean	76.9	157
Standard dev.	7.76	16.5
Variance	60.2	272
Min	37	101
Max	99	199
Skewness	-0.446	-0.0333
Kurtosis	3.33	0.137
Shapiro-Wilk W	0.961	0.994
Shapiro-Wilk p	< .001	0.650

When the descriptive statistics values of the data collection tools are analyzed, it is seen that the data are suitable for normal distribution. In addition to these data, histogram graphs of the data set were also analyzed. Histogram graphs are presented below.

**Figure 1**  
*Histograms*



As a result of the analysis, it was accepted that the distributions were suitable for normal distribution and it was decided to apply parametric statistics. The results of the t-test conducted to determine whether science teachers' multicultural education perception scale scores differed according to gender and school type variables are shown in Table 3.

**Table 3**  
*Analysis of MEPS in terms of gender and type of school*

		N	Mean	SD	df	t
Gender	Female	159	76.7	6.95	202	-0.591
	Male	45	77.5	10.2		

Type of School	Public	98	76.7	8.55	202	-0.412
	Private	106	77.1	6.99		

\* $p < 0.05$ .

Science teachers' perceptions about multicultural education do not vary according to gender and school type. The results of the ANOVA test conducted to examine whether teachers' multicultural education perception scale scores differed according to age, place of residence, educational level, and professional experience are shown in Table 4.

When Table 4 is examined, it is seen that there is a significant difference between science teachers' perceptions about multicultural education and age range for some groups ( $p < .05$ ). When the mean values are examined, it is seen that there is a differentiation between the age range of 22-27 and 46-51. Tukey, Bonferroni, and Scheffe's test results were analyzed to determine in which age range the differences in the perception of education occurred. Tukey, Bonferroni, and Scheffe's tests are given in the appendices. When the posthoc test results were examined, it was found that there was a statistically significant difference between the 22-27 age range and the 46-51 age range in favor of the 46-51 age range in all three tests. This situation reveals that teachers in the 46-51 age range have more multicultural education perceptions than teachers in the 22-27 age range. It was also found that perceptions about multicultural education differed according to experience. Tukey, Bonferroni, and Scheffe's test results were examined to determine between which subgroups the multicultural education perception scores differed according to the experience variable. The results of the analysis showed that there was a significant difference between the 0-5 year range and the 6-11 year range in favor of the 6-11 year range. This situation reveals that teachers with 6-11 years of experience have more multicultural education perceptions than teachers with 0-5 years of experience. It was also found that there was a statistically significant difference between the 0-5 year range and the 24-29 year range in favor of the 24-29 year range. This shows that teachers with 24-29 years of experience have more multicultural education perceptions than teachers with 0-5 years of experience. According to these results, it can be stated that the perception of multicultural education increases as experience increases.

**Table 4**

*Analysis of MEPS in terms of age, school location, educational background, and professional experience*

		N	Mean	SD	df	F
Age Range	22-27	37	80.7	7.07	5	3.09*
	28-33	68	76.3	5.98		
	34-39	56	76.9	7.79		
	40-45	29	76.0	6.27		
	46-51	9	71.0	17.72		
	52+	5	72.6	4.83		
School Location	City	132	77.5	7.35	3	1.78
	District	44	74.7	8.90		
	Town	9	80.4	8.28		
	Village / rural	19	75.9	6.70		
Educational Background	Master's Degree	53	77.8	5.96	2	0.587
	Undergraduate	148	76.6	8.32		
	PhD	3	77.7	8.08		
	0-5	60	79.8	6.98	4	3,63*

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Professional Experience	6-11	63	75.7	6.53
	12-17	39	76.5	6.04
	18-23	30	75.7	8.29
	24-29	12	72.9	15.04

\* $p < 0.05$ .

The results of the t-test conducted to determine whether science teachers' multicultural education competence perception scale scores differed according to gender and school type variables are shown in Table 5.

**Table 5**

*Analysis of MECPS in terms of age, school location, educational background, and professional experience*

		N	Mean	SD	df	t
Gender	Female	159	157	15.4	202	-0.484
	Male	45	158	20.1		
Type of School	Public	98	154	15.9	202	-2.31*
	Private	106	160	16.7		

\* $p < 0.05$

When Table 5 is examined, according to the Independent Groups t-Test results, it is seen that science teachers' perceptions of multicultural competence do not differ according to gender, but there is a significant difference between school types ( $p < 0.05$ ). It was observed that teachers working in private schools had higher perceptions of multicultural competence. The ANOVA results of science teachers' multicultural competence perception scale scores according to age are shown in Table 6.

**Table 6**

*Analysis of MECPS in terms of age, school location, educational background, and professional experience*

		N	Mean	SD	df	F
Age range	22-27	37	167	12.6	5	5.58*
	28-33	68	158	15.2		
	34-39	56	154	16.9		
	40-45	29	152	15.1		
	46-51	9	147	25.2		
	52+	5	150	12.6		
Educational Background	Master's Degree	53	158	17.3	2	0.170
	Undergraduate	148	157	16.3		
	PhD	3	156	10.0		
School Location	City	132	159	17.0	3	2.20
	District	44	154	15.9		
	Town	9	156	16.5		
	Village / Rural	19	150	10.9		
Professional Experience	0-5	60	164	12.1	4	6,19*
	6-11	63	155	16.5		
	12-17	39	156	17.4		

	18-23	30	150	16.5
	24-29	12	154	21.9

\* $p < .05$ 

When Table 6 is examined, it is seen that science teachers' perceptions of multicultural competence differ significantly according to age groups ( $p < .05$ ). The results of Tukey, Bonferroni, and Scheffe's tests were analyzed to determine the age range of the differences in the perception of competence. According to the results of the analysis, it was observed that there was a significant difference between the ages 22-27 and 34-39 in favor of 34-39 in all three tests. In addition, a statistically significant difference was observed between the ages 22-27 and 40-45 in favor of 40-45 in all three tests. According to these results, we can say that the perception of multicultural competence increases with increasing age. When Table 6 is examined, it is seen that there is a significant difference between the subgroups of the experience variable for science teachers' perceptions of multicultural competence ( $p < .05$ ). After the ANOVA analysis to determine between which subgroups the multicultural competence perception scores differed according to the experience variable, posthoc Tukey, Bonferroni, and Scheffe's test results were examined. According to the results of the analysis, it was observed that there was a statistically significant difference between the 0-5 year range and the 6-11 year range in favor of the 6-11 year range. The differences between the 0-5 years variable and the 6-11 years variable are indicated in the table. In addition, Tukey, Scheffe and Bonferroni Test Results are given in the appendices to show which groups are differentiated. (APPENDIX 2). In addition, it was observed that there was a statistically significant difference between the 0-5 year range and the 18-23 year range in favor of the 18-23 year range in all three tests. According to these results, it can be said that the perception of multicultural competence increases as experience increases. Pearson correlation coefficients were calculated to examine the relationship between the scores of the teachers participating in the study from the multicultural education perception scale and the multicultural competence perception scale. The results of the analysis are presented in Table 7.

**Table 7***Pearson Correlation Analysis of Participants' MEPS and MECPS*

	1	2	M	sd
1. MECPS	-	.644*		
2. MEPS	.644*	-		

\* $p < .01$ 

Table 7 shows that there is a positive and moderate relationship between the scores of teachers from the multicultural education perception scale and the multicultural competence perception scale. This finding shows that as teachers gain knowledge about multicultural education, their perception of competencies related to multicultural education can be supported.

In this part of the study, the open-ended questions asked to the participants for qualitative data were analyzed and teachers' thoughts and knowledge about multicultural education were determined. The results of the analysis carried out in line with the research problem and the interpretations developed based on them are presented. The questions were analyzed and interpreted one by one. In this section, 10 participants were coded as T1, T2, T3 for the questions directed to the teachers. The interviewed science teachers were between the ages of 26 and 60. The ages of the participants were different from each other. The ethnic origin of the participants is Turkish. 5 participants have bachelor's degree, 4 participants have master's degree and 1 participant is continuing his doctorate education. The educational status of the participants also varies. In addition, teachers work at different school levels, with 8 teachers working with middle school students and 2 teachers working with high school and middle school students. Teachers generally work at the middle school level. 5 participants work in public and 5 participants work

in private schools. The type of school where teachers work also varies. Participants have between 1.5 years and 40 years of experience. The duration of the participants' experience varies. 8 teachers work in the city center and 2 teachers work in the district center. 5 teachers have worked with foreign students and have a working period between 4 months and 4 years. The other 5 teachers have not worked with foreign students. 50% of the participants have worked with foreign students and 50% have not worked with foreign students, so the situation of working with foreign students also varies. In addition, the questions asked to the teachers included literature themes such as culture, multicultural education, multicultural science education, cultural difference, Turkish culture, foreign cultures, multicultural education program. The codes and themes obtained from the analysis of qualitative data are presented in Table 8.

**Table 8**

*Codes and themes obtained from interviews*

<b>Multicultural classroom environment</b>	<b>Challenges in multicultural classrooms</b>
Students' collaboration	Respect for others
Kindness of students to each other	Cultural Differences
Attendance to classes	Support of school administrators
Students' self-confidence	<b>Competences of the education program</b>
Respect for Others	Aims and objectives
<b>Teachers' Competences</b>	Text books
Having knowledge about multiculturalism	Process of structuring knowledge
Guiding	
Lesson planning for multiculturalism	
Classroom management	
In-service training	
Self-confident in a multicultural classroom	

According to Banks, culture consists of society's behaviors, symbols, values and other human elements (Banks, 1979). Accordingly, the teacher coded T7 said about culture: "I can say that culture is a human element that contains the characteristics of the environment where the individual is born and raised, where he/she lives, includes the customs and traditions of that environment and contributes to the development of the individual. It is the biggest factor in the individual's becoming an individual and a factor that leaves traces in his/her development." This explanation was found to be related to Banks' explanation. Teachers gave similar answers to the interview question about the definition of multiculturalism. In general, it was defined as "the coexistence of different cultures". Multiculturalism aims that people's differences and values they have are not a plus or minus and that all people should live in peace in line with equal rights (Banks, 2004). Multiculturalism is also defined as the coexistence of many different cultures, which provides an equal, respectful, sensitive, and tolerant approach without discrimination in terms of language, race, religion, gender, abilities, socioeconomic status, disabilities, age, social class and other differences (Ekşi, 2020). The definition made by the teacher coded T2 in response to this question as "I can define it as the unity and common life of individuals from different cultures who share the same environment." is similar to the definition made by Ekşi (2020). In both definitions, it is said that different cultures should be together. Similar to these definitions, the teacher coded as T7 answered "When we say multiculturalism, I can define it as the coexistence of more than one culture and/or people with different ethnic backgrounds in the living environment within the individual." Teacher coded as T8 emphasized living together in harmony by answering as "The definition that comes to my mind is the coexistence of many different cultures in harmony." Likewise, teacher coded T4 defined multiculturalism as "Multiculturalism is a word that defines a society in which many different cultures live together."

The answers given to the interview question, which asked whether cultural differences were considered in the process of students' constructing knowledge in the lessons, are given below. In

response to this question, which asked whether cultural differences were considered or not, two teachers stated that they did not take them into account and the other teachers stated that they did. The teachers who do consider include examples from the dominant culture in their lessons and include different cultures in their lessons. The teacher coded T2 mentioned that cultural differences are considered by answering "When we have students from different cultures, yes, we try to take into account both their academic perception of competencies and their cultural characteristics and to integrate them with our other students.". The teacher coded T5 said, "In the city where I work, there are students of Arab, Kurdish, and Syrian origin. For this reason, I teach in classes that include many different cultures. While giving examples in the lesson, I try to give examples based on the situations and events in the students' own culture or in their own countries (for Syrian students)." He gave the answer and said that examples are given in the lesson by considering student differences.

Teachers' opinions for the interview question about whether this situation has an effect on the academic achievement of students who receive education in a different society and culture are as follows. Teachers generally think that this situation will have a negative impact on the academic achievement of students living in a society with a different culture. They stated that this negativity is because they have difficulty understanding the language. However, there are also teachers who think that this situation will be positive in terms of academic success. Multicultural education is defined by some theorists as a practice that improves the quality of education (Gay, 2004). The teacher coded T2 said, "They have academic difficulties. The acclimatization process takes a long time. They are more afraid of making mistakes. Being embarrassed, being weak among their friends, unfortunately, reflects on their learning process as a big obstacle." and stated that students have difficulties. Likewise, the teacher coded S5 stated that the language difference had a negative effect on success and said, "I think it has a negative effect on academic success. Because students who do not know and speak the language of education do not understand the lesson and prevent them from learning and teaching the lesson. This situation causes other students to have a negative attitude towards the lesson." The teacher coded T8, who gave a similar answer, said "They may have difficulty in adapting. First of all, language differences can make this adaptation difficult and this can be a factor that directly and negatively affects academic achievement." She stated that they have difficulty in adaptation due to language differences. The teacher coded T9 also stated that "Since adaptation is difficult at a young age, there is not much academic progress. I have an Azerbaijani student in my class and he has difficulty understanding us from time to time." and stated that they had difficulties due to the small age group and language. On the contrary, there are also teachers who think that these situations will be positive. The teacher coded T4 said, "Since they are from different cultures, they act more diligently and diligently in order to catch up with their other friends in the lesson. I observe that this affects their academic achievement positively." She also mentioned that students strive to be the same as their friends in terms of lessons.

In the research, science teachers gave answers to the interview question asked to define culture in line with their own knowledge and experiences. When we look at the answers, similar definitions were made. In general, culture was defined as a way of life, traditions, customs, customs, thoughts, language, beliefs, art, environment, etc. that are unique to a society. Science teachers stated that they had heard the concept of multicultural education before. They stated that they had heard this concept in the course at the university, in daily life with the recent increase in migration, and when the number of foreign students in the school where they work increased. For the requirements of multicultural education program, science teachers generally emphasized that students from different cultures should be educated together with respect. In general, teachers stated that they pay attention to some situations while teaching the outcomes that they think are related to multicultural education in their lessons. These are; narration of the events experienced, ethical values, student levels, culture, situations that students experience in daily life, common

language, the words used by the teachers in the lesson taking into account the differences of the students.

Teachers generally stated that they take cultural differences into account. Teachers who take cultural differences into account include them in their lessons by giving examples from different cultures and mentioning the differences. Some of the teachers stated that they do not use the characteristics of Turkish culture in their classes. Other teachers stated that they do mention them in their lessons and gave some examples. Teachers generally think that this situation of students living in a society with a different culture will negatively affect their success in academic fields. They stated that this negativity is because they have difficulty in understanding the language. In addition, science teachers mentioned that in order to preserve the language, it must first be used, there must be continuity and it must be kept alive. Teachers think that being able to use different educational programs in schools has advantages related to multicultural education. These advantages can be summarized as having a world view, providing diversity in examples, increasing success, getting to know different cultures, being familiar with the programs of different cultures, getting to know different languages, breaking prejudices, and providing collaborative learning. Science teachers incorporated multiculturalism into their lessons in different ways and methods. Some teachers talked about the lives of scientists in their lessons and focused on the challenges of the culture they lived in.

Considering both quantitative and qualitative data, the age factor affects the perception of multicultural science education and the perception of competence. In quantitative data, it is seen that these perceptions increase as age increases. In the qualitative data, it can be explained by the interview questions that older teachers have more knowledge and perceptions about this subject. When the answers given by the teachers to the interview questions were analysed, it was seen that the teacher with a higher age had a higher perception of multiculturalism, knowledge about the concept of culture, multicultural education and the importance of multicultural education, perception of multicultural science education and perception of competence about the effects of multiculturalism on science course. In addition, for the experience variable presented in the quantitative data, we can say that as the experience increases, the perception of multicultural education and the perception of multicultural competence also increases. Likewise, when we look at the answers given by the teacher with 16 years of experience, the answers given by the teacher with 16 years of experience are more detailed and explanatory since he/she has encountered more student profiles and multicultural classes over the years. In addition, it was observed that the answers of teachers with more experience had more exemplifications. For example, when we look at the answers to the interview question asking about the activities carried out in order to adopt the multicultural education outcomes to the students, the teacher with more experience said, "Games help a lot in this regard. First, I want them to do some research about that culture and situation, and then we make animation with the necessary materials", while the teacher with less experience answered as follows: "I have difficulty in providing these experiences." They answered as follows. The effect of experience on the answers given is also seen here. Qualitative data obtained as a result of the interview questions also support the quantitative data. The more experienced teachers interviewed have more perceptions about this issue because they encounter more students from different cultures. Quantitative and qualitative data support each other for this research.

### **Discussion and Conclusion**

After the migrations, refugees from different countries came to Turkey. The number of Syrian refugees is increasing day by day. Teachers need to be aware of the adoption and guidance of Syrian students who come from a different country, have a different race or mother tongue (Akman, 2020). It can be considered as a critical attitude that Syrian students should not be ignored and should be taken care of in the classroom. Teachers' knowledge of multicultural education and their ability to reflect these approaches to their classrooms can increase the

effectiveness of the education process (Akman, 2020). It can be stated that teachers who have adopted multicultural education approaches can realize a more effective education with Syrian students who have different cultures. In this way, teachers' positive attitudes towards students increase and lessons are more productive. For this purpose, in recent years, research has been carried out in a wide range of perspectives such as the problems experienced by refugee students and their teachers, the psychological status of refugee students, their cultural, social and academic adaptation, and the educational policies that are trying to be developed (Akman, 2020).

In many studies in the literature, various findings on the relationship between teachers' multicultural education attitudes and attitudes towards refugee students and other variables have been revealed. It is seen that teachers' multicultural education attitudes are related to teachers' gender, age, marital status, educational status (undergraduate or graduate), seniority, and the place where they spend most of their lives (Akan, Aldemir, Dolu, & Özdoğru, 2021). In studies conducted in Turkey, it has been determined that teachers' multicultural education attitudes and attitudes towards refugee students are related to different variables. It was observed that as teachers' multicultural education attitudes and multicultural self-efficacy perceptions increased, their attitudes towards refugee students improved (Akman, 2020; Dolapçı, 2019). Teachers' attitudes are affected by their demographic characteristics.

Within the scope of this study, multicultural education perceptions and multicultural education efficacy perceptions of science teachers were examined and it was determined that both variables differed according to some demographic characteristics. As in the rest of the world, the education of refugee students in Turkey has become an increasingly important issue that is constantly on the agenda. The educational needs of refugee children are recognized as one of the basic needs to be met (Dolapçı & Kavgacı, 2020). It is very important for teachers to work more with these students and to have knowledge about this issue in terms of education. For example, teachers working in public schools may have worked more with student groups with more diversity (such as Syrian students, students who do not speak Turkish, and students with certain disorders), so they have done studies on diversity in their classes. This increased their knowledge, perception, and competence toward multiculturalism. When analyzed in terms of age variable, the perception of multicultural education and perception of competence increased as age and experience increased. The different situations that teachers have experienced over the years have positively affected their experiences, knowledge, and skills toward multiculturalism.

Another variable, place of residence, also affects multicultural perception and competence. Teachers who live and teach in rural areas know how to work with students from different groups (such as children of seasonal workers, children who have to work, children who do not speak Turkish, and children who are socioeconomically different). They can better identify students' relationships with their friends, their behaviors in the classroom, and their deficiencies. In this case, they know how to treat students from different groups in the same classroom environment. A teacher who knows how to behave towards differences will teach this to his/her students and they will know how to respect each other. On the other hand, it is seen that there is no differentiation in terms of some variables. For example, the fact that there is no differentiation in the gender variable shows that male and female teachers have equal awareness.

On the other hand, differentiation is also seen in the education status variable. When the scales were applied, the researcher expected a positive increase in the perception of multicultural education and multicultural competence as the educational level increased from undergraduate to doctorate. The fact that there was no difference showed that teachers with bachelor's degrees also have perception and competence in this regard. This is a positive situation for both the research and the teachers. As a matter of fact, the opposite of the statement may also be possible. In order to examine another sub-problem of the research, the relationship between the scores of science teachers from the multicultural education perception scale and the multicultural competence

perception scale was examined. For this purpose, the Pearson correlation coefficient was calculated between the two scales and it was determined that there was a positive and moderate relationship between the scores of the teachers on the multicultural education perception scale and the multicultural competence perception scale.

In quantitative data, the perceptions of multicultural education and multicultural competence do not change according to gender. It is also seen that gender has no effect on teachers' answers to the interview questions to collect qualitative data. Likewise, it is seen that school type has no effect on teachers' perceptions of multicultural education and multicultural competence. Teachers in public schools who responded to the interview questions know and perceive multiculturalism due to regional and cultural differences. Teachers in private schools, on the other hand, are familiar with multiculturalism because they have foreign students or students with cultural differences in their schools and because they are involved in different international programs. In both quantitative and qualitative data, it is seen that the age variable affects the perceptions of multicultural education and multicultural competence. In quantitative data, we can say that the perception of multicultural education and multicultural competence increases as age increases. In the interview questions, it is seen that as age decreases, teachers have less knowledge about multiculturalism. Teachers stated that they did not have an opinion on this issue because they did not experience or know how to exhibit an attitude towards differences. As age increases, teachers have more experience and knowledge on this subject. In the interview questions, teachers stated that they encountered more different cultures as time passed and that they knew how to exhibit a holistic approach towards differences. Accordingly, it was observed that the perceptions of multicultural education and multicultural competence changed for the experience variable in the quantitative data. In other words, we can say that the perception of multicultural education and multicultural competence increases as experience increases. The experienced teachers interviewed stated that they had more knowledge about this subject because they had the opportunity to work with students from different cultures. In the quantitative data, it is seen that the variables of place of residence and educational status have no effect on the perception of multicultural education and multicultural competence, and qualitative data also support this. It was determined that there was no difference between the answers given by a teacher with a master's degree and a teacher with a bachelor's degree.

In the research, science teachers gave answers to the interview question asked to define culture in line with their own knowledge and experiences. When we look at the answers, similar definitions were made. In general, culture was defined as a way of life, traditions, customs, thought, language, belief, art, environment, etc., that are unique to a society. Regarding the definition of the concept of multiculturalism, it was defined as "the coexistence of different cultures". It is stated that this coexistence should be within the framework of respect by positively affecting each other.

Multicultural education is defined as a reform movement and is an education in which institutions need to take a fresh look at the inclusion of structural and fundamental components that include diversity by elements such as culture, sociality, language, race, and religion (Gay, 2002). Science teachers stated that they had heard the concept of multicultural education before. They stated that they had heard this concept in the university course, in daily life with the recent increase in immigration, and when the number of foreign students increased in the school where they worked. For multicultural education, science teachers generally stated that individuals from different cultures receive equal education together. Some of the teachers also stated that this education together adds respect, diversity and integrity to them. Cultural differences can be summarized as the differences in various elements depending on the environment in which individuals live.

While multicultural education is an approach based on multiculturalism, it is an education that offers equal educational rights to students from different cultures within the dominant culture and programs should be made accordingly (Banks, 2008). School programs should be reconstructed

so that students can look at issues, events, and problems from the perspectives of different ethnic communities (Banks, 2014). For the requirements of a multicultural education program, science teachers generally emphasized that students from different cultures should be educated together with respect. They also mentioned that students should know their own culture and background. They stated that every student should be treated equally and situations that would create discrimination among students should be avoided. It was mentioned that there should be an education program designed considering the cultural backgrounds of the region where the students live. In addition to all these, teachers think that the curricula are insufficient in terms of multiculturalism. They have common views that the contents are not suitable for multiculturalism and are incomplete.

Teachers generally stated that they take cultural differences into account. Teachers who take cultural differences into account include them in their lessons by giving examples from different cultures and mentioning the differences. Science teachers generally stated that they do not use supplementary books and teaching materials for students to perceive and internalize cultural differences. Some of the teachers stated that they did not use characteristics of Turkish culture in their classes. Other teachers stated that they mentioned them in their lessons and gave some examples. Most of the teachers mentioned that they did different activities to establish a balance between foreign culture and their own culture. These activities included acting, imitating, role-playing, quoting from news, sharing articles, analyzing books and historical periods, activities introducing the culture, culture-specific foods, explaining details in science, and class discussions.

Teachers generally think that this situation of students living in a society with a different culture will negatively affect their success in academic fields. They stated that this negativity is because they have difficulty understanding the language. The first thing to be done for refugee students in refugee education is to teach Turkish. Along with education, the families of refugee students should also be taught Turkish (Eminoğlu & Eminoğlu, 2020). In addition, science teachers mentioned that in order to preserve the language, it must first be used, there must be continuity and it must be kept alive. In order to overcome the difficulties experienced, it is necessary to develop basic literacy skills to facilitate the learning of culturally diverse students, and this constitutes one of the most important goals of multicultural education (Çiftçi, 2015). Students who receive education in a different language have difficulties in lessons because they do not understand the language. Students who learn the language within the scope of the main purpose of multiculturalism will be able to understand the lessons and provide effective learning.

Multicultural education requires a transformation in schools and education, and in order to realize this, institutions and education need to be examined and changed in all aspects (Çiftçi, 2015). Changes such as student-centered education, multicultural curriculum, multicultural educational environment and culturally appropriate educational materials, supportive school and classroom climate, and fair and continuous assessment and evaluation are required for multicultural school transformation and change (Çiftçi, 2015). Among these transformations, especially curriculum change and the use of different programs are very important. The reconstruction of the school curriculum is important for students to be able to look at issues, events, and problems from the perspective of different ethnic communities (Banks, 2014). Teachers think that using different curricula in schools has advantages related to multicultural education. These advantages can be summarized as having a world view, providing diversity in examples, increasing achievement, getting to know different cultures, being familiar with the programs of different cultures, getting to know different languages, breaking prejudices, and providing collaborative learning.

According to the results of the research, it is seen that science teachers have the necessary perception and competence about multiculturalism. Although most science teachers have positive thoughts about multiculturalism in the data in the research, some science teachers have negative thoughts on this issue. Teachers should take part in informative activities such as training and

seminars about multiculturalism and multicultural education in order to eliminate their negative thoughts on this subject, to have an idea and to transfer it to their students. In addition, it is thought that these deficiencies in teachers who have deficiencies in terms of knowledge about multicultural education may be caused by attitudes towards students, not being able to take the multiculturalism course in the undergraduate period, insufficient school environment, negative views of the school administration towards multiculturalism, etc. These deficiencies should be eliminated and students should be given the necessary information on this subject. In order to teach students the concepts of culture and multiculturalism, first of all, differences should be respected and they should be ensured to respect them. The MoNE curriculum, which emphasises that no human being is exactly the same as another, emphasises that for this reason, curricula and related studies should be planned by considering differences (MoNE, 2018).

Science teachers should keep the content of lessons up to date by improving their knowledge of both science content and pedagogy, including approaches to addressing inequalities and the participation of all students in science (NSTA, 2020). Teachers should reorganise the topics in the lessons in accordance with multiculturalism. Teachers should teach students to work together, to have knowledge by respecting different cultures, and not to judge others. In addition, they should evaluate the learning differences of students by doing multicultural activities in the lesson. On the other hand, parents and administrators have an important place in multicultural education. When the studies are analysed, it is seen that parents should be in cooperation with teachers and administrators. However, parents do not cooperate in this regard, which makes the teacher's job difficult. Again, some of the parents do not know what multicultural education is and do not support the studies on this subject (Ekşi, 2020). In fact, parents should be informed about multicultural education and more studies based on the cooperation of parents should be carried out. Unfortunately, since parents are not knowledgeable about this issue, they do not know multicultural education in students and do not want to participate in studies on this subject. At this point, teachers and administrators have a job to do. Schools should develop programmes to ensure parental participation in a way that takes into account the changing characteristics of families, parents and society. Parent participation is very important at this point.

The region where the school where multicultural education principles are needed should clearly express its responsibility to create and maintain schools where students of both sexes, different races, ethnic groups, social classes, cultural and language groups will have equal opportunities in education (Banks, 2014). When the related literature is examined, it is seen that the curriculum is actually lacking for the full realisation of multicultural education. These curriculum deficiencies cannot be overcome by adding a few examples. The whole curriculum should be prepared within the framework of multiculturalism. According to NSTA standards, curriculum content should include the contributions of many cultures to our science knowledge (NSTA, 2020). In order to overcome these deficiencies, teachers integrate multiculturalism into the classroom environment by giving examples related to the subjects, doing activities, watching videos. Teaching lessons that will appeal to students from different cultures and using tools will increase the quality of the lesson as well as increase the motivation of all students. As a result of the analyses, it was seen that many subjects are related to both multiculturalism and science. In this context, topics can be linked with different activities in the classroom and students' awareness can be increased. The variety of methods and techniques used in the lesson is very important in terms of addressing the differences of students. Students can be encouraged to present different ideas by making in-class discussions using socio-scientific topics. Different videos related to the subject can be watched and the similarities and differences can be discussed. By researching the lives of scientists, their similarities and differences can be discussed and how they meet at a common point despite being in different languages and cultures can be discussed.

### **The Ethical Committee Approval**

In this study, permission was first obtained from Hacettepe University Ethics Committee (05.24.2022 / E-35853172-300-00002204002)

### **Conflict of Interest**

No conflict of interest between the authors

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## Uzun Öz

### Giriş

Tüm dünyada farklı kültürlere mensup kişiler farklı gerekçelerle bir arada uyum içinde yaşamak durumundadır. Çokkültürlü eğitimde temel hedef öğrencilerin farklılıkları göz önünde bulundurularak eşit eğitim almalarını sağlamaktır. Bu farklılıklar din, dil, ırk, cinsiyet, sosyal statü, kültür, hayat görüşü, düşünce tarzı olarak sıralanabilir. Bu tür farklılıkların olduğu ortamlarda çeşitlilik fazladır. Bu sayede öğrenciler hayata ve olaylara karşı farklı bakış açıları kazanmaktadır. Böylece öğrenciler sadece kendileri ve kendi görüşlerine göre değil başkalarının görüşlerini de göz önüne alarak düşünebilirler. Bu nedenle çokkültürlülük, eğitimin bir parçası olmaktan ziyade bütünü kapsayan bir faktör olmalıdır. Bu noktada çokkültürlü eğitime ve farklı kültürlere hâkim olan öğretmen etkin bir şekilde rol almalıdır. Öğrencinin farklılıklarına diline, dinine, ırkına, görüşüne, sosyal statüsüne gibi unsurlara saygı duyarak öğrenciyi sınıfa,

arkadaşlarına alıştırmalı ve her konuda yardımcı olmalıdır. Aynı şekilde sınıftaki diğer öğrencilere de farklı kültürlerle ve farklılıklara saygı duymayı öğretmelidir. Çokkültürlü eğitim günümüzde daha da önem kazanmış ve öğretmenlerin çokkültürlülüğe ilişkin algılarının ve çokkültürlü eğitim yeterlilik algılarının belirlenmesine yönelik ihtiyaç artmıştır.

Eğitim Reformu Girişimi'nin Eğitimde Eşitsizliğin Azaltılması Projesi - Türkiye Ulusal Raporu'na (ARISE, 2021) göre, göçmenlik statüsü öğrencilerin aldıkları eğitim üzerinde etkilidir ve Türkiye'de dört milyondan fazla göçmen statüsünde kişi bulunmaktadır. Göçmen statüsündeki ailelerin çoğunluğunun düşük sosyoekonomik statüye sahip olduğu da bilinmektedir (ARISE, 2021) ve bu durum eğitim kalitesini dolaylı olarak etkilemektedir. Göçmen öğrenciler sadece dil açısından dezavantajlı olmayıp, cinsiyet ve etnik köken gibi faktörler de entegrasyonlarını zorlaştırabilmektedir. Bu zorlukların üstesinden gelmenin yollarından biri, öğretmenlerin çokkültürlülüğe ilişkin olumlu bir algıya sahip olmaları ve çokkültürlü eğitim konusunda yetkin olmalarıdır. Ancak, Türkiye'deki hizmet içi fen bilgisi öğretmenlerinin çokkültürlü eğitime yönelik algılarını ve yeterlik algılarını inceleyen çok az çalışma vardır. Marangoz'un (2014) okul yöneticilerinin ve öğretmenlerin çokkültürlü eğitime yönelik algılarını inceleyen çalışması buna örnek olarak verilebilir. Ancak bu çalışmanın odak noktası fen bilimleri öğretmenleri değildir. Dolayısıyla bu konuda bir çalışmaya ihtiyaç duyulmuştur. Yapılan çalışmalar incelendiğinde dil öğretimi ya da sosyal bilimler alanlarında çokkültürlülük ile ilgili çalışmaların olduğu ancak fen bilimleri ile ilişkilendirmenin çok az olduğu görülmektedir. Bu araştırmanın amacı çokkültürlü eğitim hakkında ortaokullarda görev yapan fen bilimleri öğretmenlerinin algı ve yeterlilik algılarının incelenmesi olarak belirlenmiştir.

### **Yöntem**

Araştırma karma yöntemin açıklayıcı desenine (explanatory design) uygun olarak tasarlanmıştır ve fen bilimleri öğretmenlerinin çokkültürlü eğitime yönelik algı ve yeterliliklerinin belirlenmesi ve algı ve yeterliliklerinin arasındaki ilişkinin incelenmesi için Çokkültürlü Yeterlik Algıları Ölçeği ve Çokkültürlü Eğitim Algısı Ölçeği ile nicel veriler toplanmıştır. Toplanan nicel veriler doğrultusunda öğretmenlere görüşme soruları uygulanmıştır. Araştırmanın örnekleme ulaşılabilir örnekleme yöntemidir ve toplamda 204 fen bilgisi öğretmenine ulaşılmıştır. Nicel veriler için ölçeklerin uygulanmasından sonra 10 fen bilgisi öğretmeni ile yarı yapılandırılmış görüşmeler yapılarak nitel veriler toplanmış ve daha detaylı bilgiler edinilmiştir. Uygulama için öncelikle Hacettepe Etik Kurulundan izin alınmış ve öğretmenlere çalışmanın amacı belirtildikten sonra uygulamaya başlanmıştır. Veri toplamak için kullanılacak olan ölçekler öğretmenlere online şekilde ulaştırılmıştır. Kullanılacak olan iki ölçek katılımcılara birlikte verilmiştir. Araştırmacılar tarafından seçilecek olan yarı yapılandırılmış görüşme yapılan gruba dahil olan katılımcılarla görüşmeler online ortamda bireysel olarak gerçekleştirilmiştir ve kaydedilmiştir. Nicel verilerin analizinde betimsel istatistikler, t-test ve ANOVA uygulanmış ve Pearson korelasyon katsayısı hesaplanarak yorumlanmıştır. Nitel veriler ise içerik analizi yöntemi ile analiz edilmiştir.

### **Bulgular**

Araştırmadan elde edilen bulguların çokkültürlü fen eğitimine yönelik politikaların geliştirilmesine ışık tutacağı öngörülmektedir. Araştırmaya katılan öğretmenlerin yaşları, cinsiyetleri, etnik kökenleri, eğitim durumları, mesleki deneyim yılları, çalışılan okul türü ile bulunduğu bölge ve çalışılan şehirler farklılık göstermektedir. Fen bilimleri öğretmenlerinin büyük bir kısmı çokkültürlü eğitim algı ve yeterlilik algısına sahiptir. Yaş aralığı, deneyim gibi değişkenlerde farklılıklar tespit edilmiştir. Çokkültürlü eğitim algısı ölçeği için 46-51 yaş aralığı lehine istatistiksel olarak anlamlı bir fark olduğu saptanmıştır. Bu durum 46-51 yaş aralığındaki öğretmenlerin 22-27 yaş aralığındaki öğretmenlere göre daha fazla çokkültürlü eğitim algısına sahip olduğunu ortaya koymaktadır. Çokkültürlü eğitim algısı ölçeği için 0-5 yıl aralığı ile 6-11 yıl aralığında testlerde anlamlı bir fark çıktığı gözlemlenmiştir. 6-11 yıl aralığı lehine istatistiksel olarak anlamlı bir fark olduğu saptanmıştır. Bu durum 6-11 yıl deneyime sahip öğretmenlerin 0-5 yıl deneyime sahip öğretmenlere göre daha fazla çokkültürlü eğitim algısına sahip olduğunu ortaya koymaktadır. Ayrıca 0-5 yıl aralığı ile 24-29 yıl aralığında da testlerde anlamlı bir fark

çıkacağı gözlemlenmiştir. 24-29 yıl aralığı lehine istatistiksel olarak anlamlı bir fark olduğu saptanmıştır. Bu durum 24-29 yıl deneyime sahip öğretmenlerin 0-5 yıl deneyime sahip öğretmenlere göre daha fazla çokkültürlü eğitim algısına sahip olduğunu göstermektedir. Çokkültürlü yeterlik algısı ölçeği için ise 22-27 yaş ile 34-39 yaş aralığında her üç testte de anlamlı bir fark çıktığı gözlemlenmiştir. 34-39 yaş lehine istatistiksel olarak anlamlı bir fark olduğu saptanmıştır. Bu durum 34-39 yaş aralığındaki öğretmenlerin 22-27 yaş aralığındaki öğretmenlere göre daha fazla çokkültürlü yeterlik algısına sahip olduğunu ortaya koymaktadır. Ayrıca 22-27 yaş ile 40-45 yaş aralığında her üç testte de anlamlı bir fark çıktığı gözlemlenmiştir. 40-45 yaş lehine istatistiksel olarak anlamlı bir fark olduğu saptanmıştır. Bu durum 40-45 yaş aralığındaki öğretmenlerin 22-27 yaş aralığındaki öğretmenlere göre daha fazla çokkültürlü yeterlik algısına sahip olduğunu ortaya koymaktadır. Ayrıca 0-5 yıl aralığı ile 6-11 yıl aralığında testlerde anlamlı bir fark çıktığı gözlemlenmiştir. 6-11 yıl aralığı lehine istatistiksel olarak anlamlı bir fark olduğu saptanmıştır. Bu durum 6-11 yıl deneyime sahip öğretmenlerin 0-5 yıl deneyime sahip öğretmenlere göre daha fazla çokkültürlü yeterlik algısına sahip olduğunu ortaya koymaktadır. Ayrıca 0-5 yıl aralığı ile 18-23 yıl aralığında her üç testte de anlamlı bir fark çıktığı gözlemlenmiştir. 18-23 yıl aralığı lehine istatistiksel olarak anlamlı bir fark olduğu saptanmıştır. Bu durum 18-23 yıl deneyime sahip öğretmenlerin 0-5 yıl deneyime sahip öğretmenlere göre daha fazla çokkültürlü yeterlik algısına sahip olduğunu ortaya koymaktadır. Yaş ve deneyim olarak daha büyük olan fen bilimleri öğretmenleri diğer öğretmenlere göre daha yüksek çokkültürlü eğitim algı ve yeterliliğine sahiptir. Fen bilimleri öğretmenleri ile yapılan görüşme sonuçlarına göre çokkültürlü eğitim ile ilgili bilgi ve yeterliliğe sahip oldukları tespit edilmiştir. Bir diğer değişken olan yerleşim yeri de çokkültürlü algı ve yeterliliği etkilemektedir. Kırsal kesimde yaşayan ve öğretmenlik yapan öğretmenler farklı gruplardan (mevsimlik işçi çocukları, çalışmak zorunda olan çocuklar, Türkçe bilmeyen çocuklar, sosyoekonomik olarak farklı çocuklar gibi) öğrencilerle nasıl çalışacaklarını bilirler. Öğrencilerin arkadaşlarıyla ilişkilerini, sınıf içindeki davranışlarını ve eksikliklerini daha iyi tespit edebilirler. Bu durumda aynı sınıf ortamında farklı gruplardan gelen öğrencilere nasıl davranacaklarını bilirler. Farklılıklara nasıl davranacağını bilen bir öğretmen bunu öğrencilerine de öğretecek ve öğrenciler birbirlerine nasıl saygı duyacaklarını bileceklerdir. Öte yandan bazı değişkenler açısından farklılaşma olmadığı görülmektedir. Örneğin cinsiyet değişkeninde farklılaşma olmaması kadın ve erkek öğretmenlerin eşit farkındalığa sahip olduğunu göstermektedir. Araştırmada fen bilimleri öğretmenleri, kültürü tanımlamaları istenen mülakat sorusuna kendi bilgi ve deneyimleri doğrultusunda cevaplar vermişlerdir. Cevaplara baktığımızda benzer tanımlar yapılmıştır. Genel olarak kültür, bir topluma özgü yaşam biçimi, gelenek, görenek, düşünce, dil, inanç, sanat, çevre vb. olarak tanımlanmıştır. Çokkültürlülük kavramının tanımına gelince, "farklı kültürlerin bir arada yaşaması" olarak tanımlanmıştır. Bu bir arada yaşamanın birbirini olumlu yönde etkileyerek saygı çerçevesinde olması gerektiği belirtilmiştir.

### **Tartışma/Sonuç**

Bu çalışma kapsamında fen bilimleri öğretmenlerinin çokkültürlü eğitim algıları ve çokkültürlü eğitim yeterlik algıları incelenmiş ve her iki değişkenin de bazı demografik özelliklere göre farklılaştığı tespit edilmiştir. Örneğin, devlet okullarında çalışan öğretmenler daha fazla çeşitliliğe sahip öğrenci gruplarıyla (Suriyeli öğrenciler, Türkçe bilmeyen öğrenciler, bazı rahatsızlıkları olan öğrenciler gibi) çalışmış, dolayısıyla sınıflarında çeşitliliğe yönelik çalışmalar yapmış olabilirler. Bu da onların çokkültürlülüğe yönelik bilgi, algı ve yeterliliklerini artırmıştır. Yaş değişkeni açısından incelendiğinde, yaş ve deneyim arttıkça çokkültürlü eğitim algısı ve yeterlilik algısı da artmaktadır. Öğretmenlerin yıllar içinde yaşadıkları farklı durumlar, çokkültürlülüğe yönelik deneyimlerini, bilgi ve becerilerini olumlu yönde etkilemiştir. Öğretmenler genel olarak öğrencilerin farklı kültüre sahip bir toplumda yaşamalarının akademik alanlardaki başarılarını olumsuz etkileyeceğini düşünmektedir. Bu olumsuzluğun dili anlamakta zorluk çekmelerinden kaynaklandığını belirtmişlerdir. Ayrıca fen bilimleri öğretmenleri dilin korunması için öncelikle kullanılması, sürekliliğinin olması ve yaşatılması gerektiğinden bahsetmişlerdir. Yaşanan zorlukların üstesinden gelebilmek için kültürel olarak farklı öğrencilerin öğrenmelerini

kolaylaştıracak temel okuryazarlık becerilerinin geliştirilmesi gerekmektedir ve bu da çokkültürlü eğitimin en önemli hedeflerinden birini oluşturmaktadır (Çiftçi, 2015). Farklı bir dilde eğitim alan öğrenciler, dili anlamadıkları için derslerde zorlanmaktadır. Çokkültürlülüğün temel amacı kapsamında dil öğrenen öğrenciler dersleri anlayabilecek ve etkili öğrenme sağlayabileceklerdir.

Öğretmenler genel olarak kültürel farklılıkları dikkate aldıklarını belirtmişlerdir. Kültürel farklılıkları dikkate alan öğretmenler, farklı kültürlerden örnekler vererek ve farklılıklara değinerek derslerine dahil etmektedir. Fen bilimleri öğretmenleri genel olarak öğrencilerin kültürel farklılıkları algılamaları ve içselleştirmeleri için yardımcı kitap ve öğretim materyalleri kullanmadıklarını belirtmişlerdir. Öğretmenlerin bir kısmı Türk kültürüne ait özellikleri derslerinde kullanmadıklarını belirtmiştir. Diğer öğretmenler ise derslerinde bunlara değindiklerini ve bazı örnekler verdiklerini belirtmiştir. Öğretmenlerin çoğu yabancı kültür ile kendi kültürleri arasında bir denge kurmak için farklı etkinlikler yaptıklarını belirtmiştir. Bu etkinlikler arasında rol yapma, taklit etme, canlandırma, haberlerden alıntı yapma, makale paylaşma, kitap ve tarihi dönem analizi, kültürü tanıtıcı etkinlikler, kültüre özgü yiyecekler, bilimdeki ayrıntıları açıklama ve sınıf tartışmaları yer almaktadır. Öğretmenler genel olarak öğrencilerin farklı kültüre sahip bir toplumda yaşamalarının akademik alanlardaki başarılarını olumsuz etkileyeceğini düşünmektedir. Bu olumsuzluğun dili anlamakta zorluk çekmelerinden kaynaklandığını belirtmişlerdir. Mülteci eğitiminde mülteci öğrenciler için yapılması gereken ilk şey Türkçe öğretmektir. Eğitimle birlikte mülteci öğrencilerin ailelerine de Türkçe öğretilmelidir (Eminoğlu ve Eminoğlu, 2020). Ayrıca fen bilimleri öğretmenleri, dilin korunması için öncelikle kullanılması, sürekliliğinin olması ve canlı tutulması gerektiğinden bahsetmişlerdir. Yaşanan zorlukların üstesinden gelebilmek için kültürel olarak farklı öğrencilerin öğrenmelerini kolaylaştıracak temel okuryazarlık becerilerinin geliştirilmesi gerekmektedir ve bu da çokkültürlü eğitimin en önemli hedeflerinden birini oluşturmaktadır (Çiftçi, 2015). Farklı bir dilde eğitim alan öğrenciler, dili anlamadıkları için derslerde zorlanmaktadır. Çokkültürlülüğün temel amacı kapsamında dil öğrenen öğrenciler dersleri anlayabilecek ve etkili öğrenme sağlayabileceklerdir.

## EKLER

### EK 1: Görüşme Soruları

#### A) Demografik bilgiler ile ilgili sorular

1) Cinsiyet:

2) Yaş:

3)Etnik köken:

4) Eğitim geçmişi:

5) Öğretmenlik geçmişi:

6)Çalışılan okul türü:

7)Çalışılan il:

8)Okulun bulunduğu yerleşim bölgesi:

Şehir merkezi/ilçe merkezi/kasaba-belde/köy-kırsal

9) Yabancı öğrencilerle (kültürel farklılığı olan öğrencilerle) çalışma süresi (eğer varsa)

#### B) Çokkültürlü eğitim ile ilgili sorular

1) Sizce kültür nedir? Kültürü nasıl tanımlarsınız?

2) Çokkültürlü eğitim kavramını daha önce duydunuz mu? Duyduysanız ne zaman ve hangi koşullar altında duydunuz?

- 3) Çokkültürlülük kavramını nasıl tanımlarsınız?
- 4) Çokkültürlülük denildiğinde zihninizde oluşan şema nedir? Çokkültürlülük denildiğinde zihninizde oluşan şemadan bahseder misiniz?
- 5) Çokkültürlü eğitim ve kültürel farklılık kavramlarını nasıl tanımlarsınız?
- 6) Sizin için ideal bir çokkültürlü eğitim programı nasıl olmalıdır?
- 7) Kullandığınız ders programlarını çokkültürlü içerik açısından değerlendirirseniz neler söylersiniz?
- 8) Programda çokkültürlü eğitim ile ilgili olduğunu düşündüğünüz kazanımları verirken nelere dikkat ediyorsunuz?
- 9) Bu kazanımları öğrencilerinizin düşünmesini, benimsemesini ve kendi yaşamlarında davranışa dönüştürmelerini nasıl sağlıyorsunuz?
- 10) Derslerinizde öğrencilerinizin bilgiyi yapılandırma sürecinde kültürel farklılıklarını dikkate alıyor musunuz? Nasıl?
- 11) Öğrencilerinizin kültürel farklılıkları algılaması ve içselleştirmesi için yardımcı kitaplar ve öğretim materyalleri kullanıyor musunuz? Kullanıyorsanız bunlar nelerdir?
- 12) Türk kültürüyle ilgili özellikleri sınıfta ne ölçüde ve nasıl kullanıyorsunuz?
- 13) Yabancı bir kültür ve kendi kültürünüz arasındaki dengeyi öğrencilerinizin kurması için ne gibi eğitici etkinlikler yapıyorsunuz?
- 14) Farklılıklara saygı ve hoşgörü konusunda öğrencilerinizin tutum ve davranışları hakkında neler söyleyebilirsiniz?
- 15) Okul çevrenizle olan kültürel farklılıkları yönetirken karşılaştığınız en büyük zorluk nedir? Sizce bu zorluğun aşılması için ne yapılmalıdır?
- 16) Farklı bir kültüre sahip toplumda yaşayan öğrencilerinizin bu durumunun akademik alanlardaki başarılarına etkisi konusunda ne düşünüyorsunuz?
- 17) Sizce bir dilin korunmasında en önemli öğeler nelerdir?
- 18) Okullarda farklı eğitim programları kullanabilmenin çokkültürlü eğitim ile ilgili avantajları var mıdır? Varsa nelerdir? Bu avantajlar nasıl hayata geçirilir?
- 19) Çokkültürlülüğü fen derslerine nasıl dâhil edebilirsiniz? Dâhil etmek için neler yapıyorsunuz?
- 20) Çokkültürlü bir fen eğitim programı nasıl olmalıdır? Örneklerle açıklayabilir misiniz?
- 21) Bu konuda eklemek istediğiniz herhangi bir şey var mı?

**EK 2: Tukey, Scheffe ve Bonferroni Test Sonuçları**

**Tablo 1**

*Katılımcıların Çokkültürlü Eğitim Algılarının Yaş Aralığı Değişkenine Bağlı Olarak Tukey, Scheffe ve Bonferroni Test Sonuçları*

Yaş aralığı	Yaş aralığı	Ort. Farkı	SE	df	t	p <sub>tukey</sub>	p <sub>scheffe</sub>	p <sub>bonferroni</sub>
22-27	- 28-33	4.36	1.54	198	2.83	0.05	0.16	0.075
	- 34-39	3.79	1.60	198	2.37	0.17	0.34	0.276
	- 40-45	4.73	1.87	198	2.53	0.11	0.27	0.180
	- 46-51	9.70	2.80	198	3.46	0.00	0.04	0.010
	- 52'NİN ÜSTÜ	8.10	3.59	198	2.25	0.21	0.40	0.376
28-33	- 34-39	-0.57	1.36	198	-0.42	0.99	0.99	1.000
	- 40-45	0.37	1.67	198	0.22	1.00	1.00	1.000
	- 46-51	5.33	2.67	198	1.99	0.34	0.55	0.706
	- 52'NİN ÜSTÜ	3.73	3.49	198	1.07	0.89	0.94	1.000
34-39	- 40-45	0.94	1.72	198	0.54	0.99	0.99	1.000
	- 46-51	5.91	2.70	198	2.18	0.24	0.44	0.451
	- 52'NİN ÜSTÜ	4.31	3.52	198	1.22	0.82	0.91	1.000
40-45	- 46-51	4.96	2.87	198	1.72	0.51	0.70	1.000
	- 52'NİN ÜSTÜ	3.36	3.65	198	0.92	0.94	0.97	1.000
46-51	- 52'NİN ÜSTÜ	-1.60	4.20	198	-0.38	0.99	1.00	1.000

**Tablo 2**

*Katılımcıların Çokkültürlü Eğitim Algularının Deneyim Değişkenine Bağlı Olarak Tukey, Scheffe ve Bonferroni Test Sonuçları*

Deneyim	Deneyim	Ortalama Farkı	SE	df	T	P <sub>Tukey</sub>	P <sub>Scheffe</sub>	P <sub>Bonferroni</sub>
0-5	- 6-11	4.0857	1.37	198	2.99	0.036	0.116	0.047
	- 12-17	3.2615	1.56	198	2.09	0.294	0.497	0.562
	- 18-23	4.1000	1.69	198	2.42	0.154	0.324	0.245
	- 24-29	7.4364	2.48	198	2.99	0.036	0.116	0.046
	- 30+	0.8000	7.63	198	0.10	1.000	1.000	1.000
6-11	- 12-17	-0.8242	1.54	198	-0.53	0.995	0.998	1.000
	- 18-23	0.0143	1.68	198	0.00	1.000	1.000	1.000
	- 24-29	3.3506	2.47	198	1.35	0.754	0.871	1.000
	- 30+	-3.2857	7.63	198	-0.43	0.998	0.999	1.000
12-17	- 18-23	0.8385	1.84	198	0.45	0.997	0.999	1.000
	- 24-29	4.1748	2.58	198	1.61	0.589	0.760	1.000
	- 30+	-2.4615	7.67	198	-0.32	1.000	1.000	1.000
18-23	- 24-29	3.3364	2.67	198	1.25	0.811	0.905	1.000
	- 30+	-3.3000	7.70	198	-0.42	0.998	0.999	1.000
24-29	- 30+	-6.6364	7.91	198	-0.83	0.960	0.982	1.000

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**Tablo 3**

*Katılımcıların Çokkültürlü Yeterlik Algularının Yaş Aralığı Değişkenine Bağlı Olarak Tukey, Scheffe ve Bonferroni Testlerinin İncelenmesi*

Yaş Aralığı		Yaş Aralığı	Ortalama Farkı	SE	df	t	p <sub>Tukey</sub>	p <sub>Scheffe</sub>	p <sub>Bonferroni</sub>
22-27	-	28-33	8.55	3.21	198	2.664	0.087	0.219	0.125
	-	34-39	13.36	3.33	198	4.011	0.001	0.008	0.001
	-	40-45	14.86	3.90	198	3.811	0.003	0.015	0.003
	-	46-51	19.89	5.84	198	3.405	0.010	0.045	0.012
	-	52'NİN ÜSTÜ	16.89	7.49	198	2.256	0.218	0.408	0.378
28-33	-	34-39	4.80	2.84	198	1.693	0.538	0.720	1.000
	-	40-45	6.30	3.49	198	1.808	0.463	0.659	1.000
	-	46-51	11.34	5.58	198	2.034	0.327	0.532	0.650
	-	52'NİN ÜSTÜ	8.34	7.28	198	1.145	0.862	0.933	1.000
34-39	-	40-45	1.50	3.60	198	0.417	0.998	0.999	1.000
	-	46-51	6.54	5.64	198	1.158	0.856	0.930	1.000
	-	52'NİN ÜSTÜ	3.54	7.34	198	0.482	0.997	0.999	1.000
40-45	-	46-51	5.03	6.00	198	0.839	0.960	0.982	1.000
	-	52'NİN ÜSTÜ	2.03	7.61	198	0.267	1.000	1.000	1.000
46-51	-	52'NİN ÜSTÜ	-3.00	8.77	198	-0.342	0.999	1.000	1.000

**Tablo 4**  
*Katılımcıların Çokkültürlü Yeterlik Algularının Deneyim Değişkenine Bağlı Olarak Tukey, Scheffe ve Bonferroni Testlerinin İncelenmesi*

Deneyim	Deneyim	Ortalama Farkı	SE	Df	t	Ptukey	Pscheffe	Pbonferroni
0-5	- 6-11	9.291	2.87	198	3.237	0.018	0.068	0.021
	- 12-17	8.347	3.27	198	2.550	0.115	0.265	0.173
	- 18-23	14.217	3.56	198	3.995	0.001	0.009	0.001
	- 24-29	10.571	5.22	198	2.025	0.332	0.536	0.663
	- 30+	4.117	16.05	198	0.257	1.000	1.000	1.000
6-11	- 12-17	-0.944	3.24	198	-0.291	1.000	1.000	1.000
	- 18-23	4.925	3.53	198	1.395	0.730	0.856	1.000
	- 24-29	1.280	5.20	198	0.246	1.000	1.000	1.000
	- 30+	-5.175	16.04	198	-0.323	1.000	1.000	1.000
12-17	- 18-23	5.869	3.86	198	1.519	0.653	0.805	1.000
	- 24-29	2.224	5.43	198	0.409	0.999	0.999	1.000
	- 30+	-4.231	16.12	198	-0.263	1.000	1.000	1.000
18-23	- 24-29	-3.645	5.61	198	-0.650	0.987	0.995	1.000
	- 30+	-10.100	16.18	198	-0.624	0.989	0.996	1.000
24-29	- 30+	-6.455	16.62	198	-0.388	0.999	1.000	1.000