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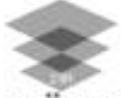


EPÖDER EĞİTİM PROGRAMLARI VE ÖĞRETİM DERNEĞİ  
TURKISH CURRICULUM AND INSTRUCTION ASSOCIATION

# ULUSLARARASI EĞİTİM PROGRAMLARI VE ÖĞRETİM ÇALIŞMALARI DERGİSİ

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## Baş Editörden

26-28 Ekim 2022 tarihinde Gazi Üniversitesi ve EPÖDER işbirliğinde düzenlenen 10. Uluslararası Eğitim Programları ve Öğretim Kongresinin hemen ardından yayımlanan bu sayımızda yine alanımıza yönelik farklı ve nitelikli çalışmaların yer almasından dolayı gururluyuz.

Aralık 2022 sayımızda 'özel gereksinimli aileler ve okul paydaşları işbirliği; okuryazarlık ve matematik becerilerinin farklı ülkelere göre karşılaştırması; yabancı dil eğitimine yönelik bir meta sentez çalışması; öğretmen adaylarının düşünme becerileri; çokkültürlü öğretmen yeterlikleri; tarihsel düşünme becerisi ölçek geliştirilmesi ve eğitimde teknoloji entegrasyonu önerisi' gibi nitelikli makalelere yer verilmiştir.

Bu sayımıza katkıda bulunan tüm yazarlarımızı çalışmalarından dolayı tebrik ediyoruz ve başarılarının devamını diliyoruz. Ayrıca başta Eğitim Programları ve Öğretim alanından değerlendirme tekliflerimizi geri çevirmeyip, makaleleri titizlikle inceleyen alanlarında tüm akademisyenlerimize, yayın kuruluna ve editörler kuruluna dergimizin yayımlanması için yapmış oldukları özverili katkılarından dolayı çok teşekkür ederiz. IJOCIS'in daha üst veri tabanlarında dizinlenmesi için hiçbir karşılık beklemeden titizlik, ciddiyet ve tutarlılıkla çalışmaya devam ediyoruz. Ayrıca, süreçte ekibe yeni katılan ve makale metinlerini titizlikle kontrol eden arkadaşlarımız oldu. Kendilerine katkılarından dolayı teşekkür ediyoruz.

Başta ERIC ve TR Dizin tarafından dizinlenen IJOCIS'e yüklenen makale sayısı her geçen gün artmaktadır. 2023 yılı itibariyle dergimizde süreci devam eden ve yüklenecek makalelerin APA7 stiline uygun olarak hazırlanmasını sağlayacağız. Dergimize makale yükleyecek olan yazarların buna dikkat etmesi gerekmektedir.

Eğitim Programları ve Öğretim alanında çalışan ülkemizdeki ve dünyadaki tüm eğitimcileri dergimize bilimsel niteliği yüksek ve özgün çalışmalar göndermeleri için, her zaman olduğu gibi, çağrımızı yineliyoruz.

Esenlik dileklerimizle.

Prof. Dr. Kerim GÜNDOĞDU

## **From the Editor in Chief**

We are proud to have different and qualified studies related to our field in this issue, which we published right after the 10th International Education Programs and Instruction Congress, organized with the cooperation of Gazi University and EPÖDER on October 26-28, 2022.

In our December 2022 issue, qualified articles such as 'cooperation between families with special needs and school stakeholders; comparison of literacy and mathematics skills according to different countries; a meta-synthesis study on foreign language education; thinking skills of prospective teachers; multicultural teacher competencies; historical thinking skill scale development and a proposal for technology integration in education' were included.

We congratulate all our authors who contributed to the publication of this issue and wish them continued success. In addition, we would like to thank all our academic reviewers who are experts in their fields for carefully reviewing the articles and for their devoted contributions to the publication of our journal, without rejecting our reviewer assignments from the field of Curriculum and Instruction,

We continue to work with diligence, seriousness and consistency, without expecting anything in return, for the indexing of IJOCIS in higher databases. In addition, we had freshly joint members contributing meticulously to review process of the articles. We sincerely thank them for their efficient contribution.

The number of articles uploaded to IJOCIS, which is indexed by ERIC and TR Index, is increasing day by day. Starting from 2023, we will ensure that the articles that are in progress or that will be newly uploaded in our journal will be published in accordance with the APA7 style. We expect authors who will upload articles to our journal to pay attention to this point.

As always, we reiterate our call to all educators studying in the field of Curriculum and Instruction in our country and worldwide to submit original and high-quality studies to our journal.

With our best regards.

Prof. Dr. Kerim GÜNDOĞDU



## Building Links between Early Academic Skills and Later Academic Achievement: A Cross-Country Analysis

Umut Birkan Özkan, National Defence University, uozkan@msu.edu.tr,  0000-0001-8978-3213

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Preschool curriculum  
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### Abstract

This study focuses on the relationship between students' early academic skills and academic achievement. In this context, it is aimed to examine the predictors of students' early literacy and numeracy skills on their later math and science achievements across countries. A quantitative research approach using a correlational survey design was performed. The sample of this study consists of 15815 fifth-grade students who participated in TIMSS-2019 from Norway, South Africa, and Türkiye. Multiple linear regression analysis was used to analyze data obtained from two different scales and students' math and science tests. The study's findings supported the essential roles that early literacy and numeracy skills play in fifth-grade students' math and science achievement in the three-country contexts. The results revealed that the more frequent involvement of parents in early literacy activities could increase children's later science achievement and that children's ability to perform early numeracy tasks better when beginning primary school could increase students' later mathematics achievement. Another result of the study is that for countries where all of the other early academic skills within the scope of this study are statistically significant, they can contribute positively to students' later mathematics and science achievement, which may be long-term. Finally, it is recommended that activities and tasks to increase parental participation can be included in preschool curricula. In addition, support that can help children develop early academic skills can be provided to children who have not yet started primary school and their parents.

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## Introduction

One of the leading indicators of the outcomes of the curriculum is academic achievement. The academic achievement reflects the degree to which a student, teacher/instructor, curriculum, and educational institution have met set educational goals (Kpolovie, Joe, & Okoto, 2014). It can be said that to the extent that academic achievement is high, students acquire the curriculum objectives. One of the factors that make academic achievement necessary is that it plays a decisive role in preparing students well-equipped for professional and social life and shaping their future (Bücker, Nuraydin, Simonsmeier, Schneider, & Luhmann, 2018; Peng & Kievit, 2020; Sarier, 2016; Yıldırım, 2000). Academic achievement, in general, refers to the thinking skills and competencies related to communication (speaking, reading, writing), mathematics, science, and social sciences that enable a student to be successful “in school and society” (Lindholm-Leary & Borsato, 2006, p. 176). Because these forms of achievement are challenging to assess, a narrower definition is made that is generally limited to the results of standardized achievement tests. Therefore, what is usually meant by academic achievement is a result that shows the quality of their academic work, such as standardized achievement tests, students' course grades, or grade point average (York, Gibson, & Rankin, 2015). However, academic achievement is a product of recent and old familial, community, and educational experiences (Rivkin, Hanushek, & Kain, 2005). One of these experiences is students' early academic skills.

Early academic skills are literacy and numeracy skills in preschool (Uyanık & Kandır, 2010). Early academic skills include basic literacy abilities such as letter recognition and phonemic awareness and numeracy abilities such as knowledge of numbers and understanding the order of numbers (Rabiner, Godwin, & Dodge, 2016). Before discussing the conceptual framework for linking early academic skills and later academic achievement, a model that can help to better establish this connection is presented in Figure 1.

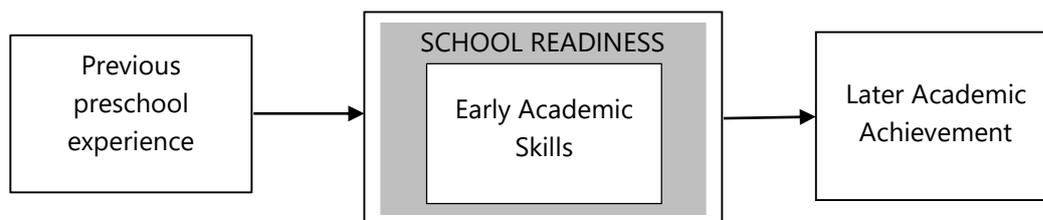


Figure 1. *Early Academic Skills Framework*. Adapted from "Ready for School? Systematic Review of School Readiness and Later Achievement," by Marília Mariano et al., 2019, *Global Journal of Human-Social Science Research*, 19(10), p. 63. Copyright 2019 by the Global Journals.

The framework in Figure 1 shows that early academic skills in the school readiness phase from previous preschool experiences are linked to later academic achievement. Some studies in the literature showed the associations between early academic skills and later academic achievement, as explained in Figure 1 (Duncan et al., 2007; La Paro & Pianta, 2000; Murrah III, 2010; Pagani, Fitzpatrick, Archambault, & Janosz, 2010; Rabiner et al., 2016; Romano, Babchishin, Pagani, & Kohen, 2010; Stevenson & Newman, 1986). In one of these studies, Stevenson and Newman's (1986) longitudinal study, a group of children was tested before starting kindergarten, and these children were monitored in the first, second, third, fifth, and tenth grades. In conclusion, these children's achievement test scores were associated with

acquiring early academic skills in literacy and numeracy, such as recognizing letters and numbers. While this study provided significant findings, it had a small sample ( $n=255$ ) and was conducted in Minneapolis, a city in the Midwest region of the United States. Therefore, since this study has a specific and limited sample in terms of cultural, geographical, and educational level, its results should be approached from this perspective.

Another study in the literature is the research of La Paro and Pianta (2000). This meta-analysis examined 70 longitudinal studies reporting the relationships between "academic/cognitive and social/behavioral measures administered in preschool or kindergarten and similar measures administered in first and second grade" (La Paro & Pianta, 2000, p. 443). As a result of this study, it was found that there was a moderate correlation ( $r=.48$ ) in cognitive/academic skills from kindergarten to first or second grade. The sample sizes of the 70 studies examined ranged from 9 to 866. In this meta-analysis study, almost half of the samples were more than 50% Caucasian, and almost half involved children from primarily middle or high socioeconomic status (SES) families. The available data indicate that the use of variables such as ethnicity and development level is limited in this study.

An international consortium has investigated early academic skills that are important in predicting later academic achievement, focusing on literacy and numeracy (Duncan et al., 2007). Using six longitudinal datasets from the United States of America, Canada, and Great Britain, Duncan et al. (2007, p. 1428) examined the relationship "between three key elements of school readiness—school-entry academic, attention, and socioemotional skills—and later school reading and math achievement." All six studies concluded that the strongest predictors of later academic success were math, reading, and attention skills at the beginning of school. In a meta-analysis study, done by Duncan et al. (2007), early mathematics skills had the highest predictive power, followed by reading and attention skills. This meta-analysis study focused on children from the USA, Great Britain, and Canada. Therefore, only the data of children from highly-developed countries were examined. From this point of view, although it provides crucial results for developed countries, it cannot give an idea about developing or underdeveloped countries.

Pagani et al. (2010) conducted a study similar to that of Duncan et al. (2007). The similarity between the two studies was that Pagani et al. (2010) used the data analysis strategy Duncan et al. (2007) used. What differentiated the research was that it was conducted with data from native French-speaking children in Canada. Pagani et al. (2010, p. 984) examined possible relationships "between cognitive, attention, and socio-emotional characteristics underlying kindergarten readiness and mathematics, reading, and general achievement" in second grade. At the end of the study, it was reported that cognitive and attention characteristics in kindergarten predict success at the end of the second grade. Pagani et al.'s (2010) study focused on students from the developed country, Canada, as in the studies cited earlier. Besides, student outcomes belong to the end of the second year and second grade is not that far up the academic ladder. There is a need to see results from studies that reflect longer-term outcomes.

Romano et al. (2010) conducted other research that augmented and extended the findings of Duncan et al.'s (2007) study. The study examined the effects of kindergarten literacy and math abilities, mother-reported attention, and socioemotional behaviors on third-grade math and reading outcomes using data on 1521 children from the National Longitudinal Survey of

Children and Youth (NLSCY) (Romano et al., 2010). Like Duncan et al. (2007), early literacy and numeracy skills were the strongest predictors of later achievement. Romano et al.'s study also has limitations encountered in other studies: developed country sample only and short-term (end of third grade) student outcomes. Studies using samples of countries with different cultural, geographical, and developmental levels and presenting longer-term results are needed.

Murrah III (2010) conducted a study using school readiness skills to find predictors of later academic achievement in mathematics, reading, and science. The study's data were obtained from the Early Childhood Longitudinal Study - 1998 database. The study's findings showed that early literacy and numeracy abilities predict accomplishment later in life and that school entry abilities can predict achievement in reading, math, and science later in life (Murrah III, 2010). Compared to Pagani et al.'s (2010) and Romano et al.'s (2010) studies, this study used long-term (fifth grade) student outcomes. However, a limitation encountered in other studies is also evident in this study: the sample of the USA, a developed country, was used.

One of the issues that Rabiner et al. (2016) examined in their study is the relationship between early childhood characteristics and academic outcomes in the fifth grade. One study shows that early literacy skills predict reading and math achievement after the fifth grade. Early numeracy skills predicted only mathematics achievement. Unfortunately, the small sample of this study was not nationally representative, and all participants attended schools selected because of high concentrations of students at risk for developing conduct problems. Moreover, all of these participants were from the USA. Also, there was no mention of subsequent scientific achievement in this study.

Despite extensive previous research, it can be argued that there are significant gaps in the knowledge of how early academic skills affect long-term academic achievement. One of these gaps is the limitations in revealing the relationship of early academic skills with later science achievement. In addition, studies that consider early academic skills as a predictor have been conducted in high-income and developed countries and have not exceeded this limitation. Although these studies play a pioneering role in preventive intervention, they are criticized for their polarizing nature because they do not consider different social structures in terms of cultural, geographical, and educational levels (Narayan et al., 2018). Although this aspect is open to discussion, considering the importance of early academic skills in academic achievement emphasized in these studies, conducting a similar study with different and independent populations in terms of cultural, geographical, and educational levels may help generalize the results and evaluate them from different perspectives. International examination of the relationship of early academic skills to later academic achievement requires using the same data collection tools and sampling method for each country, and such data are seldom available. In the absence or absence of such data, studies examining the relationship between early academic skills and academic achievement for a single grade level in different countries may be particularly susceptible to ignoring validity and reliability factors. When seeking to understand how early academic skills related to "later academic achievement, it is important to consider how outcomes are measured, and test performance provides an important independent assessment of academic achievement" (Duncan et al., 2007, p. 1431). One of the large-scale assessment studies in which such data can be collected is the Trends in International Mathematics and Science Study (TIMSS).

The main aim of TIMSS is to measure students' knowledge and skill levels and to assess the education system's outcomes (Oral & McGivney, 2013). In other words, TIMSS offers comparative information on student accomplishment across nations over time and in connection to significant factors in the home, school, and classroom (Mullis, Martin, Foy, Kelly, & Fishbein, 2020). While TIMSS measures the performance of fourth- and eighth-grade students in the fields of mathematics and science, data is also collected on the variables that affect student success through questionnaires applied to the students participating in the application, their teachers and parents, and school administrators (Suna, Şensoy, Parlak, & Özdemir, 2020). At TIMSS 2019, data was collected through a home questionnaire given to the parents or caregivers of fourth-grade students to understand better the effects of early academic skills on student achievement in mathematics and science (Hooper, Mullis, Martin, & Fishbein, 2017).

While data on early academic skills are collected for different countries in the TIMSS-2019, general projections on the subject are kept, and it is up to researchers interested in the issue to clarify the details. On the other hand, based on the literature review conducted between 2019-2022, there is no cross-country comparative study investigating the relationship between students' early academic skills (literacy and numeracy skills) and their later mathematics and science achievements using the extensive data set provided by TIMSS-2019. Therefore, it can be said that the role of early academic skills in students' academic achievement has not been investigated significantly using a current and large data set. The present study focuses on the relationship between students' early academic skills and academic achievement. In this context, it is aimed to examine whether students' early literacy and numeracy skills predict their later mathematics and science achievement, with a cross-country comparison involving Norway, South Africa, and Türkiye. An attempt has been made to address the current gap in the research field by investigating the two research questions:

Do the early literacy and numeracy skills of fifth-grade students in Norway, South Africa, and Türkiye predict their;

1. Later mathematics achievement?
2. Later science achievements?

Considering the educational inequality between countries, differences in academic achievement between countries are an important global problem in education today (Organisation for Economic Co-operation and Development [OECD], 2018). Determining the skills significant to academic achievement is critical in designing interventions to reduce these achievement differences. Achievement differences may result from deficiencies in early academic skills (Heckman, 2006). For this reason, its possible contribution to a better understanding of how these early skills are related to academic achievement, especially for children from different cultural, geographical, and educational levels, makes the study important. An examination of the findings of studies in the literature showed that interventions in the preschool period are more effective than later interventions (Heckman, Pinto, & Savelyev, 2013). Therefore, the results obtained from the present study may help suggest various suggestions that can be implemented in preschool curricula to improve students' academic achievement.

## Method

The present quantitative study, a relational survey design, analyzes whether the early academic skills of fifth-grade students predict their academic achievement by analyzing the secondary data obtained from TIMSS-2019. Correlational studies examine how closely differences in one variable correspond to differences in one or more other variables (Leedy, Ormrod, & Johnson, 2021). A study process known as secondary data analysis can be characterized as an empirical exercise with procedural and evaluative steps, much like gathering and analyzing primary data (Johnston, 2017). The reason for the preference of this method in this research is that studies using secondary data allow reaching new and/or additional findings that were not included in the original research (Sherif, 2018) and can "be used to provide a comparison with other contexts, over other periods, and across other social groups and cultures" (Corti, 2008, p. 801).

### Population and Sample

TIMSS-2019 defines students attending the fourth and eighth grades of formal education as the international target population. As an exceptional case, England, Norway, South Africa, and Türkiye participated in the fourth-grade implementation of the TIMSS-2019 cycle at the fifth-grade level (Suna et al., 2020). In the present study, countries that participated in TIMSS-2019 at the fifth-grade level were included to understand the predictive power of early academic skills on academic achievement over a longer period. However, it was not included in the study in England because data on early academic skills were not collected. In addition to the fact that Norway, South Africa, and Türkiye participate at the fifth-grade level, their cultural, geographical, and educational differences are another factor in their preference. Norway ranks 11th, Türkiye 23rd, and South Africa 56th out of 58 countries in the TIMSS-2019 mathematics ranking. Similarly, Norway ranks eighth, Türkiye 19th, and South Africa 56th out of 58 countries in the TIMSS-2019 science rankings. In other words, it can be said that the countries that are in the upper, middle, and last places in mathematics and science achievement are within the scope of the study. From a geographical point of view, it is seen that the three countries are on different continents. Norway is in Northern Europe, South Africa is the southernmost country of the African continent, and Türkiye is a transcontinental country connecting Europe and Asia. In terms of the level of human development, Norway ranks first, Türkiye 54th, and South Africa 114th in the ranking, which includes 189 countries in the Human Development Index (United Nations Development Programme, 2020). Therefore, it can be stated that the countries within the study's scope are at different development levels.

The three countries are also culturally different from each other. Cultural difference is socially acquired values, beliefs, and rules of conduct that can be distinguished from one society to another (Jackson & Guerra, 2011). Since the first half of the 19th century, efforts have been made to establish a national culture in Norway, and the traditional cultural structure has been preserved for many years (Aşkan, 1998; Karpuz, 1999). Norway has also been included in the globalization process, which has negative effects on the national culture, and multiculturalism has been included in Norway's cultural policy (Bakke, 2001). At the beginning of 2021, immigrants and those with two immigrant parents born in Norway made up 18.5% of Norway's population (Norwegian Ministries, 2022). Norway's national population projections imply that within a decade, the population will be made up of older people than children and

teenagers, according to the national demographic forecasts for 2022, which show reduced population growth paired with stronger aging (Thomas & Tømmerås, 2022). In Norway, where religious pluralism is increasingly established, the official religion is Christianity (Önal, 2016). In Norway, equality is regarded as a key objective for society, and attempts to advance equality are seen as obligations under human rights law (Norwegian Ministry of Children, Equality and Social Inclusion, 2012).

When South Africa is examined in terms of cultural structure, it is striking that it has a very heterogeneous structure in terms of ethnic origin, official spoken language (11 official languages), and belief diversity (Özoran, 2014; Sevim, 2019). South Africa is a country where inequalities in income distribution and living standards are high and an important center of attraction for immigrants (Adepoju, 2003). Following the first democratic elections in 1994, South Africa has made remarkable progress in building a new nation in which all South Africans have equal rights (The Department of International Relations and Cooperation [DIRCO], 2022). Although South African women have fought for the nation's independence and gender equality for a long time, they finally reached the 50/50 target for women in the Cabinet in 2019 (Burger, 2020).

Türkiye also has its cultural characteristics. Anatolia, in which Türkiye was founded, is one of the oldest civilization centers in the world, and in this respect, it has thousands of years of experience besides the dominant Turkish culture (Sancak, 2016). However, Turkish society has been experiencing an international cultural interaction and change process with Western culture for various reasons since the 18th century (Türkkahraman, 2009). Türkiye has been greatly affected by the cultural dimension of globalization, and as a result, a considerable change and transformation process has begun in the tastes and interests of Turkish society (Bayar, 2008). Despite this, global culture has not displaced local culture in Türkiye, and the trend towards Western culture has not excluded local culture (Rankin, Ergin, & Gökşen, 2014). Similarly, it is stated that although the social structure in Türkiye has changed, some cultural patterns have been preserved (Kasapoğlu & Ecevit, 2004).

The TIMSS implementations employ a two-stage random sample design, with a first stage of selecting a sample of schools and a second stage of choosing one or more entire classes of students from each of the sampled schools (LaRoche, Joncas, & Foy, 2020). The population and sample of the three countries within the scope of the study are given in Table 1.

Table 1. *Population and Sample Sizes*

Country	Population		Sample (Number of Students Assessed)		Participation Rates		Analyzed Sample* (N)
	Schools (N)	Students (N)	Schools (N)	Students (N)	Class Participation (%)	Student Participation (%)	
Norway	1945	62012	150	3951	99	89	2327
South Africa	16254	943115	297	11891	100	96	9794
Türkiye	16205	1239900	180	4028	100	99	3694
Total	34404	2245027	627	19870	99.67	94.67	15815

*Note.* Population, sample, and participation rates were adapted from *Methods and Procedures: TIMSS 2019 Technical Report* by Michael O. Martin, Matthias von Davier, and Ina V.S. Mullis, 2020, p. 9.24-261. Copyright 2020 by the International Association for the Evaluation of Educational Achievement (IEA).

\* The researcher calculated the analyzed sample.

The sample size given in Table 1 is the number of students participating in the assessment. The sample size calculated before the TIMSS-2019 assessment may be higher for schools or students. TIMSS guidelines emphasize that the minimum acceptable participation rate for sample participation is 85 percent for both schools and students. The participation rates given in Table 1 show that all three countries fulfill the 85% criterion. However, the number of students analyzed for mathematics and science is less than the number of participants due to missing information. In exclusion of observations with lacking or missing data from the data set, it can be assumed that these data are entirely randomly distributed (Çüm, Demir, Gelbal, & Kışla, 2018). The idea behind the utterly random distribution of data is that the likelihood of missing data for a given variable is independent of the value of either that variable or any other variable in the data set (Demir & Parlak, 2012). The remaining data can be viewed as a simple random sampling from some vast population if this assumption holds valid for all variables in the data set (Allison, 2002). Since the deleted data is student data, it can be accepted that the remaining data represent the original data set since it does not affect its value or any other variable in the data set. However, due to the large size of samples and the small number of excluded students, the missing data were not completed with statistical techniques.

### **Data Collection Instruments**

The study's data were obtained from two different scales developed by the collaboration of "the questionnaire development team at the TIMSS & PIRLS International Study Center and the TIMSS Questionnaire Item Review Committee" and students' mathematics and science tests (Hooper et al., 2017, p. 59). The "Early Literacy and Numeracy Activities Scale" and the "Early Literacy and Numeracy Tasks Scale."

#### *The Early Literacy and Numeracy Activities Scale*

One of the scales used was the Early Literacy and Numeracy Activities scale. This scale, which consists of 18 items, was answered by the parents. The question "before your child began primary/elementary school, how often did you or someone else in your home do the following activities with him/her?" was asked to parents via the survey (Yin & Fishbein, 2020, p. 16.25). Parents answered the questions as "often," "sometimes," or "never or rarely" (Yin & Fishbein, 2020, p. 16.25). Some of the statements were "read books," "play word games," "count different things," and "write numbers" (Yin & Fishbein, 2020, p. 16.25).

#### *The Early Literacy and Numeracy Tasks Scale*

Another scale from which data was obtained is the Early Literacy and Numeracy Tasks scale. Parents responded to twelve items under three questions through the Early Literacy and Numeracy Tasks scale. The first question was "How well could your child do the following when he/she began the first grade of primary/elementary school?" (Yin & Fishbein, 2020, p. 16.32). There were seven statements associated with the question, such as "read some words", "write letters of the alphabet", and "write his / her name" (Yin & Fishbein, 2020, p. 16.32). Parents matched them with the appropriate one of "very well", "moderately well", "not very well", and "not at all" (Yin & Fishbein, 2020, p. 16.32). The second question was "Could your child do the following when he/she began the first grade of primary/elementary school?" (Yin & Fishbein, 2020, p. 16.32). The tasks associated with the question were "count by himself/herself", "recognize written numbers", and "write numbers" (Yin & Fishbein, 2020, p. 16.32). Parents marked one of "up to 100 or higher", "up to 20", "up to 10", and "not at all" for the tasks (Yin

& Fishbein, 2020, p. 16.32). Finally, the question "Could your child do the following when he/she began the first grade of primary/elementary school" was asked again to the parents (Yin & Fishbein, 2020, p. 16.32). The parents answered as "yes" or "no" to the expressions given for the question as "do simple addition" and "do simple subtraction" (Yin & Fishbein, 2020, p. 16.32).

The Cronbach's Alpha reliability coefficient and percent of variance explained by the Early Literacy and Numeracy Activities scale, and the Early Literacy and Numeracy Tasks scale are given in Table 2.

Table 2. Cronbach's Alpha Reliability Coefficient and Percent of Variance Explained of the Scales

Country	Early Literacy and Numeracy Activities Scale		Early Literacy and Numeracy Tasks Scale	
	Cronbach's $\alpha$ Reliability Coefficient	Variance Explained, %	Cronbach's $\alpha$ Reliability Coefficient	Variance Explained, %
Norway	.87	31	.90	48
South Africa	.88	32	.85	39
Türkiye	.94	50	.95	64

*Note.* From *Methods and Procedures: TIMSS 2019 Technical Report* by Michael O. Martin, Matthias von Davier, and Ina V.S. Mullis, 2020, p. 16.29-36. Copyright 2020 by the International Association for the Evaluation of Educational Achievement (IEA).

Cronbach's alpha coefficients given in Table 2 are .70 and above, so the scales can be considered reliable with countries' samples (Pallant, 2005). In addition, it is deemed sufficient for single-factor designs to explain 30% or more of the variance (Büyüköztürk, 2003). The variance explained values in Table 2 are greater than 30%, indicating that the relevant structures are well measured in all three countries.

Mathematics and science scores of students were used as an indicator of academic achievement, which is the dependent variable of the current study. Five plausible values were calculated for math and science tests in TIMSS-2019. OECD (2017, p. 145) stated that "the plausible value methodology uses proficiency distributions and accounts for error (or uncertainty) at the individual level by using multiple imputed proficiency values (plausible values) rather than assuming that this type of uncertainty is zero." In simpler terms, plausible values represent the range of plausible proficiency a student may have based on students' responses to items (Wu, 2005). Plausible values are random scores derived "from the distribution of scores that can be reasonably assigned to each" student (Monseur & Adams, 2009, p. 6), and "plausible values are generated using students' responses to the items and conditioning them according to all available background data" (Laukaityte & Wiberg, 2017, p. 11344). Therefore, five different plausible values are calculated for students. Using only one of the five plausible values or the mean may cause the standard error values to be miscalculated (Rutkowski, Gonzalez, Joncas, & von Davier, 2010). It is recommended that all five reasonable values be included in the calculations for the analyses (OECD, 2009). In the current study, all five plausible values were included in the analysis as dependent variables at the same time to obtain unbiased and stable estimates, and suggestions were made on using probable values in large-scale international evaluations (OECD, 2009; Rutkowski et al., 2010) were taken into account.

## Data Analysis

Multiple linear regression (MLR) analysis was used in the data analysis. In social science research, MLR is a potent approach for spotting intricate relationships between data (Nimon, 2010). MLR makes it possible to investigate the relationships between more than one continuous or categorical independent variable and one continuous dependent variable (Coxe, West, & Aiken, 2013). The bilateral correlations between dependent and independent variables in this study are presented in Table 3.

Table 3. *The Bilateral Correlations (r) between Dependent and Independent Variables*

Country	Variables	Correlations (r)					
		(1)	(2)	(3)	(4)	(5)	(6)
Norway	Early literacy activities before school (1)	1.00					
	Early numeracy activities before school (2)	.74	1.00				
	Early literacy tasks beginning school (3)	.37	.33	1.00			
	Early numeracy tasks beginning school (4)	.24	.26	.54	1.00		
	Mathematics achievement scores (5)	.12	.12	.29	.26	1.00	
	Science achievement scores (6)	.18	.12	.25	.15	.78	1.00
South Africa	Early literacy activities before school (1)	1.00					
	Early numeracy activities before school (2)	.73	1.00				
	Early literacy tasks beginning school (3)	.38	.34	1.00			
	Early numeracy tasks beginning school (4)	.15	.13	.33	1.00		
	Mathematics achievement scores (5)	.21	.18	.19	.22	1.00	
	Science achievement scores (6)	.22	.18	.18	.22	.91	1.00
Türkiye	Early literacy activities before school (1)	1.00					
	Early numeracy activities before school (2)	.81	1.00				
	Early literacy tasks beginning school (3)	.52	.50	1.00			
	Early numeracy tasks beginning school (4)	.48	.48	.65	1.00		
	Mathematics achievement scores (5)	.40	.39	.27	.35	1.00	
	Science achievement scores (6)	.46	.43	.30	.36	.89	1.00

The correlation values given in Table 3 indicate a relationship between the variables in this study. Four are the predictor variable, and the other two are the predicted variables. There are low-level correlations among some variables ( $r=.10 - .29$ ), moderate-level correlations among some ( $r=.30 - .49$ ), and high-level correlations between some variables ( $r=.50 - 1.00$ ). It was found that there were positive relations between all variables.

MLR is typically used to assess how independent or explanatory factors affect output (Farina, San Martín, Preiss, Claro, & Jara, 2015). Considering that students' academic achievement is related to multiple factors related to early academic skills in the current study, the dependent variable can be predicted accurately and realistically by employing the MLR model's optimal arrangement of several independent variables (Xiao, Liu, & Hu, 2019). In standard algebraic notation, the general expression of the MLR model is:

$$y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

In this model;

y: Mathematics and science achievement scores (1-5 plausible values),

$\beta_n$ : Partial regression coefficient,

- x<sub>1</sub>: Early literacy activities before school (ASBHELA),
- x<sub>2</sub>: Early numeracy activities before school (ASBHENA),
- x<sub>3</sub>: Early literacy tasks beginning school (ASBHELT),
- x<sub>4</sub>: Early numeracy tasks beginning school (ASBHENT),
- ε: Error term.

For the analysis, the students' mathematics and science scores and the scales used were matched one-to-one using TIMSS-2019 Student IDs. After the matching process, the data generated for each country were analyzed with the IEA International Database Analyzer Version 4.0.36 (IDB Analyzer) software. IDB Analyzer can perform statistical analysis by considering sample design and sample weights. IDB Analyzer provides convenient tools for estimating sampling errors and coefficients that reflect the sample design, but assumptions about multiple linear regression must be verified (Mirazchiyski, 2014).

One of the assumptions of MLR analysis is the normal distribution. According to Lumley, Diehr, Emerson, and Chen (2002), no assumption of the normal distribution is necessary for sufficiently large samples. For large samples, "the law of large numbers and the central limit theorem mechanism both work" because "the sample mean of a large number of observations will be close to the mean or will have a distribution close to normal, even if the observations themselves do not have normal distribution" (Shatskikh & Melkumova, 2016, p. 767). Based on the law of large numbers and central limit theorem theories, it can be said that the normal distribution is provided in the TIMSS-2019 sample (DasGupta, 2010). In addition, the assumption that the relationship between the predictor and the predicted variables is linear was investigated with scatter plots. In the investigation, it was seen that the variables had a linear relationship, and the points showed the values of the variables gathered around the regression line.

Further, in large-scale assessments, the plausible values such as mathematics and science achievement scores assume a flat linear regression with all students' background variables as regressors, and "like most linear models, homoscedasticity and normality of the conditional variance are assumed" (Monseur & Adams, 2009, p. 1). Another assumption is that there is no multicollinearity. One of the ways to determine multicollinearity is to use a correlation matrix. However, variance inflation factor (VIF) values were investigated instead of the correlation matrix in the current study since linearity may occur between three or more variables even if the independent variables are not highly correlated in pairs (Lavery, Acharya, Sivo, & Xu, 2019). Since the IDB Analyzer software used in data analysis did not calculate the VIF values, independent regression equations using each independent variable as the dependent variable were created, and VIF values were calculated using the formula  $VIF=1/(1-R^2)$  (Robinson & Schumacker, 2009).  $R^2$  in this formula is the coefficient of determination from the linear regression model. The VIF values calculated to control whether there is a problem of multicollinearity among the predictive variables are given in Table 4.

Table 4. *VIF Values*

<i>Variables</i>	<i>VIF values</i>		
	<i>Norway</i>	<i>South Africa</i>	<i>Türkiye</i>
ASBHELA	2.27	2.27	3.02
ATHENA	2.22	2.17	2.99
ASPHALT	1.54	1.30	1.96
ASBHENT	1.43	1.12	1.85

Since all of the VIF values given in Table 4 are values less than five, it can be said that there is no multicollinearity problem among the predictive variables (Bowerman, O'Connell, & Murphree, 2015).

The "enter" method, the default method in IDB Analyzer, was selected when performing multiple regression analyses. All specified variables were entered simultaneously, regardless of their significance level (George & Mallery, 2020). Based on the study's conceptual framework, the "enter" method was used in this analysis since one independent variable was not considered more important than the others (Hinton, Brownlow, McMurray, & Cozens, 2004).

## Results

This section presents the results reported in line with the research questions. First, descriptive statistics to facilitate the interpretation of the results were included. Then, the results obtained for the two research questions were reported and interpreted.

### Descriptive Statistics

Knowing the descriptive statistics for each country can facilitate the interpretation of the findings in the present study, which aims to make a cross-country examination. Therefore, descriptive statistics for all predictor and predicted variables used in the study are reported in Table 5. The values were calculated for each country using the IDB Analyzer program to take care of sampling weights based on the TIMSS-2019 sampling procedure.

Table 5. *Descriptive Statistics of Variables*

<i>Variables</i>	<i>Countries</i>	<i>Minimum</i>	<i>Maximum</i>	<i>M</i>	<i>SD</i>
Early Literacy Activities Before School	Norway			10.47	1.92
	South Africa	1.90	14.98	9.73	2.05
	Türkiye			8.95	2.91
Early Numeracy Activities Before School	Norway			10.17	1.76
	South Africa	2.61	15.33	9.83	2.18
	Türkiye			9.26	2.89
Early Literacy Tasks Beginning School	Norway			9.06	1.71
	South Africa	4.56	13.47	10.47	1.74
	Türkiye			8.87	2.66
Early Numeracy Tasks Beginning School	Norway			9.48	1.76
	South Africa	4.74	13.05	9.83	1.91
	Türkiye			9.51	2.38

Table 5 (Cont.)

Mathematics achievement*	Norway	251.19	806.65	542.67	74.12
	South Africa	67.61	786.44	373.56	100.21
	Türkiye	113.22	844.85	522.86	99.50
Science achievement*	Norway	262.64	762.74	539.40	66.67
	South Africa	5.00	821.13	324.23	133.03
	Türkiye	107.55	786.98	526.36	90.90

\* The minimum and maximum scores in mathematics and science achievement are the minima and maximal scores within five plausible values.

In mathematics and science achievement, Norway had the highest mean and South Africa the lowest. In countries other than Türkiye, the mean mathematics scores were higher than the science mean. It is worth noting that parents of Norwegian students stated that they participated more frequently in preschool early literacy and numeracy activities. Parents of South African students also stated that they did better in early literacy and numeracy tasks when their child began the first grade of primary/elementary school. In addition, Türkiye, which had a lower average score than South Africa in all early academic skills, had a much higher average than South Africa in mathematics and science scores.

### The Results on the Prediction of Early Literacy and Numeracy Skills of Fifth-Grade Students in Norway, South Africa, and Türkiye in Their Later Mathematics Achievement

MLR analyzes were conducted using each country's data to answer the first research question. The findings showed that early literacy and numeracy skills could be used to predict the later mathematics achievement of students in high-, medium-, and low-achieving countries. MLR analysis results are presented in Table 6.

Table 6. MLR Analyzes Results Investigating the Associations between the Early Academic Skills and Students' Mathematics Achievement

Countries	MLR Model Summary	MLR Coefficients				
		Independent Variables	Unstandardized weight		Standardized weight	
			B	Std. Error	$\beta$	t
Norway	R <sup>2</sup> =.10 Adjusted R <sup>2</sup> =.10 F <sub>(3,2323)</sub> =86.04 p<.01	(Constant)	409.67	15.84		
		ASBHELA	.02	1.56	.00	.02
		ATHENA	9.35	1.34	.22	6.86*
		ASPHALT	.45	1.54	.01	.29
		ASBHENT	5.73	1.41	.14	4.13*
South Africa	R <sup>2</sup> =.09 Adjusted R <sup>2</sup> =.09 F <sub>(3,9790)</sub> =322.75 p<.01	(Constant)	159.87	14.91		
		ASBHELA	6.34	1.06	.13	6.16*
		ATHENA	4.47	1.27	.08	3.46*
		ASPHALT	1.75	1.04	.04	1.70
		ASBHENT	9.34	.93	.18	10.77*
Türkiye	R <sup>2</sup> =.20 Adjusted R <sup>2</sup> =.20 F <sub>(3,3690)</sub> =307.50 p<.01	(Constant)	342.74	14.62		
		ASBHELA	7.39	1.17	.21	6.55*
		ATHENA	-2.06	1.20	-.05	-1.71
		ASPHALT	5.10	1.34	.15	3.80*
		ASBHENT	8.98	1.19	.21	7.91*

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\* Statistically significant t values at  $p < 0.01$  level.

Early academic skill variables explained variance in mathematics achievement differently for each country, from 9% (in South Africa) to 20% (in Türkiye). The variance among countries implied that the multilevel model of the study was more effective for Türkiye than other countries. This means that for Norway and South Africa, other student-level variables might explain differences among students. Early numeracy tasks beginning school (ASBHENT) was a variable that predicted mathematics achievement positively in all countries. Accordingly, students who did better at various numeracy tasks when they first began the first grade of primary/elementary school had higher math scores. As expected, parents' frequent involvement in numeracy activities with their children before school (ASBHENA) positively predicted mathematics achievement in Norway and South Africa.

On the other hand, surprisingly, ASBHENA is not a significant predictor of students' mathematics achievement in Türkiye. More frequent involvement of parents with their children in literacy activities before school (ASBHELA) positively predicted mathematics achievement in the middle- and low-achieving countries. These results mean that a student whose parent participates more often in early literacy activities gets higher scores in math. However, in Norway, which ranks high in mathematics achievement, no relationship was found between ASBHELA and mathematics achievement. Therefore, it was concluded that ASBHELA has no role in predicting mathematics achievement for high-achieving countries. Early literacy tasks beginning school (ASBHELT), one of the early academic skill variables, positively predicted mathematics achievement only for Türkiye.

### **The Results on the Prediction of Early Literacy and Numeracy Skills of Fifth-Grade Students in Norway, South Africa, and Türkiye in Their Later Science Achievement**

It investigated whether early literacy and numeracy skills predicted the later science achievement of students in the countries surveyed to answer the second research question. The findings showed that it is possible to use students' early literacy and numeracy skills in diverse countries to predict their later science achievement. MLR analyzes results regarding science achievement are presented in Table 7.

Early academic skill variables explained variance in science achievement differently for each country, from 7% (in Norway) to 24% (in Türkiye). The variance among countries implied that the multilevel model of the study was more effective for Türkiye compared to other countries in science achievement. This means that for Norway and South Africa, other student-level variables might explain science achievement differences among students. Early literacy activities before school (ASBHELA) was a variable that predicted science achievement positively in all countries. Therefore, students whose parents participated more frequently in early literacy activities had higher science scores. More frequent involvement of parents in numeracy activities with their children before school (ASBHENA) positively predicted students' science achievement in Norway and South Africa. However, ASBHENA was not a significant predictor of the science achievement of students in Türkiye. Early numeracy tasks beginning school (ASBHENT) positively predicted science achievement in countries with medium and low achievement in science. This finding means that students who could do various numeracy tasks better when he or they first began primary school scored higher in science in later grades than students who could not. However, in Norway (eighth), which ranked high in the TIMSS-2019

science achievement rankings, there was no relationship between ASBHENT and science achievement. Therefore, it was concluded that ASBHENT did not predict science achievement for high-achieving countries. Early literacy tasks beginning school (ASBHELT), another early academic skill variable, positively predicted science achievement only for Türkiye, as was the case with mathematics achievement.

Table 7. *MLR Analyzes Results Investigating the Associations between the Early Academic Skills and Students' Science Achievement*

Countries	MLR Model Summary	MLR Coefficients				
		Independent Variables	Unstandardized weight		Standardized weight	
			B	Std. Error	$\beta$	t
Norway	R <sup>2</sup> = .07 Adjusted R <sup>2</sup> = .07 F <sub>(3,2323)</sub> =58.28 p<.01	(Constant)	436.02	17.13		
		ASBHELA	5.10	1.55	.14	3.40*
		ATHENA	7.95	1.29	.20	5.94*
		ASPHALT	-2.17	1.48	-.06	-1.46
		ASBHENT	.98	1.39	.03	.71
South Africa	R <sup>2</sup> = .09 Adjusted R <sup>2</sup> = .09 F <sub>(3,9790)</sub> =322.75 p<.01	(Constant)	45.41	19.94		
		ASBHELA	9.33	1.46	.14	6.60*
		ATHENA	4.57	1.69	.06	2.69*
		ASPHALT	2.37	1.44	.04	1.66
		ASBHENT	12.28	1.27	.17	10.14*
Türkiye	R <sup>2</sup> = .24 Adjusted R <sup>2</sup> = .24 F <sub>(3,3690)</sub> =388.42 p<.01	(Constant)	349.62	14.85		
		ASBHELA	9.34	1.10	.29	9.06*
		ATHENA	-.99	1.06	-.03	-.93
		ASPHALT	3.82	1.16	.12	3.30*
		ASBHENT	7.01	1.05	.18	6.89*

\* Statistically significant t values at  $p < 0.01$  level.

## Discussion, Conclusion, and Implications

In the current study, early academic skills that predict later mathematics and science achievement of students in Norway, South Africa, and Türkiye were determined with TIMSS-2019 data. A comparable set of regression analyzes was conducted to assess whether early academic skills were predictors of later academic achievement. Mathematics and science achievements measured as late in the data set as possible were regressed on early literacy and numeracy activities before primary school and early literacy tasks beginning school.

The first research question focused on whether the early literacy and numeracy skills of fifth-grade students in different countries predicted their later mathematics achievement. As expected, the MLR results showed that students' numeracy tasks skills when they first began the first grade of primary/elementary school were statistically significant predictors of subsequent mathematics achievement, with standard coefficients ranging from .14 to .21. This result is compatible with the results of studies in the literature (Duncan et al., 2007; Murrah III, 2010; Pagani et al., 2010; Rabiner et al., 2016; Romano et al., 2010). Early math skills were significantly positively linked with interest and self-confidence in mathematics (Balala, Areepattamannil, & Cairns, 2021). Students who were confident in their knowledge and skills in mathematics and found mathematics interesting had higher mathematics scores than the

others (Akyüz, 2014; Arıkan, Van de Vijver, & Yağmur, 2016; Tavşancıl & Yalçın, 2015; Yavuz, Demirtaşlı, Yalçın, & Dibek, 2017). Moreover, successfully practicing and completing early numeracy tasks can offer opportunities to increase math self-efficacy that can contribute to later mathematics achievement (Zhu & Chiu, 2019). For this reason, students who do numeracy tasks better at the beginning of school may have higher success in mathematics later on.

Parental involvement in preschool literacy activities was a statistically significant predictor of later mathematics achievement in Türkiye and South Africa, but not Norway. A similar conclusion was reached in the study of LeFevre, Polyzoi, Skwarchuk, Fast, and Sowinski (2010). In the study by LeFevre et al. (2010), the relationship between parents' participation in literacy activities and students' mathematics outcomes in Greece and Canada, which have math achievements similar<sup>1</sup> Türkiye and Norway were investigated. As in the present study's comparison between Türkiye and Norway, Greek parents' participation in literacy activities was less frequent than Canadian parents (as seen in Table 5, the frequency of participation of Turkish parents in literacy activities is lower than that of Norwegian parents), and, for Greek children only, home literacy activities also predicted math outcomes for Turkish children only. The conversations and interactions promoted by parents' participation in early literacy activities enable children to develop specific skills and attitudes, such as increasing their vocabulary, decoding, and word recognition (Sénéchal & LeFevre, 2002). Students who have developed these skills and attitudes can more easily understand mathematical facts, concepts, procedures, conceptual understanding, unusual situations, complex contexts, multi-step problems, and reading and interpreting data. There may be various reasons why the variable is not a significant predictor of Norwegian students' mathematics achievement. One might be that the power of the relationship between academic achievement and early literacy has diminished over the years, depending on factors such as the quality of teachers, schools, and education (Bulut, 2021). Because Norway, which ranks first in the Human Development Index and also ranks high in the TIMSS-2019 ranking, provides more qualified education services compared to the other two countries, the predictive power of the variable for the other two countries may be lost over time. Here is an issue that needs to be discussed. These results mean that while parental involvement in preschool literacy activities in Norway was predictive of students' science achievement, it was not a predictive factor in the mathematics achievement of Norwegian students with the same qualification. In other words, parent involvement in preschool literacy activities was a significant predictor of Norwegian students' science achievement, but why was it not a significant predictor of math achievement? As mentioned before, the scope of science is related to real-life, and learning in these subjects is more permanent learning. However, 80% of the content of the TIMSS-2019 math test consisted of knowing the cognitive domain and applying it (Mullis et al., 2020). The content included simple equations, algebra, fractions and decimals, geometry, and angles. Thus, the quality mathematics education in the first five years of primary school in Norway may have become the dominant predictor of Norwegian students' mathematics achievement, rather than preschool literacy activities with their parents.

The frequency of parent involvement in early numeracy activities (ASBHENA) was positively associated with math achievement in the highest and lowest performing countries (Norway

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<sup>1</sup> Since Greece did not participate in TIMSS-2019, the comparison was made according to the results of PISA-2018.

and South Africa). This result aligns with the previous research (Huang, Zhang, Liu, Yang, & Song, 2017; Hwang, 2020; LeFevre et al., 2009; Zhu & Chiu, 2019). The regression coefficient for Türkiye was not statistically significant. This result is similar to Blevins-Knabe, Austin, Museum, Eddy, and Jones' (2000) study. Blevins-Knabe et al.'s (2000) study revealed that limited frequency numeracy activities were not significantly associated with children's math achievement scores. Descriptive statistics (Table 5) can answer why ASBHENA is not a significant predictor of students' subsequent mathematics achievement in Türkiye. According to descriptive statistics, Türkiye's ASBHENA average score was lower than other countries. For Turkish students with a low parental involvement in early numeracy activities, effective mathematics classroom instruction may have compensated for ASBHENA, thus reducing its importance for mathematics achievement. Manolitsis, Georgiou, and Tziraki's (2013) study results in Greece, a country similar to Türkiye in terms of geographical location and mathematical achievement, can be used as a basis for this assumption. Manolitsis et al. (2013) showed that the relationship between Greek children doing numeracy activities at home with their parents and counting at the beginning of kindergarten becomes negligible. Accordingly, the ASBHENA variable may have lost its importance on mathematics achievement in the fifth grade for Turkish students whose parents' participation in early numeracy activities was already low.

The second research question focused on the early literacy and numeracy skills of fifth-grade students in different countries and was identified as the predictor of students' later science achievement. The study's findings showed that parent involvement in preschool literacy activities (ASBHELA) was a statistically significant predictor of later science achievement for all three countries. In general, the content element of the science curriculum consists of popular and directly related to real-life topics such as health-related phenomena (student's body, health, and diseases), unexplained space and phenomena, sexuality and reproduction, environmental problems, biodiversity (Jidesjö, Oscarsson, Karlsson, & Strömdahl, 2009). Therefore, science is a part of everyday life, and all people, regardless of age, want to know the fundamental scientific principles that govern the world they live in (Andrée, 2005; Aniashi, Okaba, Anake, & Akomaye, 2019; Gürdal, 1992). The scope of the TIMSS-2019 science test also coincided with this content (Mullis et al., 2020). Students whose parents frequently participate in preschool literacy activities begin to contact their parents and ask questions about the things they are curious about and want to learn and start doing research (Hayes, Berthelsen, Nicholson, & Walker, 2018; Lin et al., 2019; Uyanık & Kandır, 2010). Children who examine written and visual sources about science subjects, which are a part of daily life with their parents, and reach the answers to the questions together, can increase their knowledge about science and their interest in science. The increase in students' knowledge and interests may have contributed to the growth in students' science achievement.

Early numeracy activities before school (ASBHENA) positively predicted science achievement in Norway and South Africa. ASBHENA was not a meaningful predictor for Türkiye. Descriptive statistics showed that Türkiye's ASBHENA means lower than other countries. Although there is no similar study in the literature, it is noteworthy that this result parallels the one in mathematics achievement. It seems consistent that ASBHENA was not a significant predictor of mathematics and science achievement for Turkish students whose parents had a low frequency of participation in early numeracy activities. Therefore, as with mathematics

achievement, the limited participation of parents in early numeracy activities may have led to the loss of ASBHENA's importance on science achievement over time.

The variable ASBHENT, a significant predictor of later mathematics achievement in all three countries, also significantly predicted science achievement for South Africa and Türkiye but was not significant for Norwegian students' later science achievement. ASBHENT was measured as the ability to perform operations on numbers, such as counting by oneself, recognizing written numbers, writing numbers, and performing simple addition and subtraction (Yin & Fishbein, 2020). Both because of the level of complexity and because of the nature of science courses that require mechanisms specific to relational reasoning (Blums, Belsky, Grimm, & Chen, 2017), the predictive of basic numeracy skills in the science achievement of Norwegian students with high science achievement may not be as strong as that of students in the other two countries with lower science achievement averages. As a result, it can be said that while ASBHENT was a significant predictor of science achievement of students with medium and low science achievement, it was not a significant predictor of science achievement of students with high science achievement.

Concerning the first and second research questions, a common research finding showed that ASBHELT (early literacy tasks beginning school) variable was a significant predictor of Turkish students' achievement in both mathematics and science. ASPHALT was not a significant predictor of either mathematics or science achievement in the other two countries. Makin and Whitehead (2004) stated that children's literacy skills are related to the opportunities provided to children. One of these opportunities is participation in preschool education. Only 24% of Turkish students in TIMSS-2019 had attended preschool education for two years or more, compared to 68% for South African students and 97% for Norwegian students (Mullis et al., 2020). Thus, it may have made no meaning that Norwegian and South African students who benefited more from preschool education were able to perform early literacy tasks to predict their later mathematics and science achievement. Because they may have acquired skills that can predict later mathematics and science achievement in the preschool education period, and that can be more dominant than being able to perform early literacy tasks. However, Turkish students who did not benefit much from preschool education better performed early literacy tasks, which reflect the development of other cognitive and academic skills (Haney, 2002), and may have been a significant predictor of their later mathematics and science achievement.

The study's limitations should be considered when evaluating the current study's findings. First, a limited number of variables related to early academic skills were included in the study. Also, these variables were obtained from scales answered by parents in TIMSS-2019. Huang et al. (2017) emphasize that parents' responses to scales can be affected by social desirability. Secondly, since TIMSS-2019 did not administer a test for reading comprehension skills, students did not have reading literacy scores. Therefore, whether early literacy and numeracy skills predict students' later literacy achievement could not be examined. Third, the cross-country generalizability of the study's findings may be limited, as the nature and extent of parents' involvement in their children's early literacy and numeracy activities can vary considerably from one country to another.

In conclusion, despite the study's limitations, empirical support was provided for the crucial roles that early literacy and numeracy skills play in fifth-grade students' math and science achievement in the three-country context. More frequent involvement of parents in early

literacy activities can help grow later science achievement regardless of country. In addition, better performance of early numeracy tasks at the beginning of primary school can increase students' later mathematics achievement without being affected by international differences. These results suggest that the link between ASBHENT and mathematics achievement and between ASBHELA and science achievement does not immediately break. Instead, it remains essential even in the fifth year of formal education. Other early academic skills within the scope of this study (ASBHENA and ASBHELT) can contribute positively to students' later mathematics and science achievement in countries where they are statistically significant, and this contribution may be long-term.

The results of the study have important implications for curricula and practices. The first implication is that mathematics and science achievement depends not only on variables in the formal primary school process but also on the frequency with which parents participate in early academic activities and students' ability to perform early academic tasks. The preschool curricula of South Africa and Türkiye, and Norway's framework plan for kindergartens emphasize the importance of parent involvement in early academic activities and tasks (Department of Basic Education, 2015; Directorate for Education and Training, 2017; Ministry of National Education, 2013). Examples of early academic activities and tasks are not found in the curricula implemented in Norway and Türkiye. It can be said that the examples of early academic activities and tasks are included in the Family Support Education Guide, which is prepared in an integrated manner with the preschool curriculum in Türkiye, but these examples are few. It can be said that the Family Support Education Guide (Ministry of National Education, 2013b) is teacher-centered rather than parents-centered. Such activities and tasks are written for the areas of early learning and development in The United Nations International Children's Emergency Fund (UNICEF)-funded curriculum implemented in South Africa (Department of Basic Education, 2015). For example, for early mathematics learning and development area, "Help young children make books about numbers and counting," "Repeat the counting words children use and show them how counting helps us to find out how many," "Adults and young children can sing songs and rhymes about numbers and counting" activities are available in The South African National Curriculum (Department of Basic Education, 2015, p. 52). Such and more developed and enriched early academic activities and tasks that parents can participate in at home can be included in preschool curricula to increase students' later mathematics and science achievement.

One of the present study results is that children's ability to do preschool math tasks predicts math achievement. Mononen, Audio, Koponen, and Aro's (2014, p. 25) study also showed "that different types of instructional design features (explicit instruction, computer-assisted instruction, game playing, or the use of concrete-representational-abstract levels in representations of math concepts, etc.) lead to improvements in mathematics performance." If these two results are considered together, another implication can be made: In order to develop children's ability to do preschool math tasks, activities for the use of game-based computer-assisted teaching that can facilitate the transition from concrete to abstract can be included in the learning situations element of preschool curricula. Since ASBHENT is a positive predictor of later mathematics achievement for three countries, support activities can be carried out by a teacher specialized in mathematics through individual and small-group instruction for students who have difficulty doing numeracy tasks.

Given the essential roles that early literacy skills play in improving students' mathematics and science achievement, parents and teachers are vital in supporting young children's literacy development. However, not all parents have the necessary skills to participate effectively in the literacy activities of their young children. From this perspective, it is essential to support parents to enable their young children to contribute to literacy development. Parent-teacher partnerships can be encouraged and supported to empower parents in this field. This issue was extensively covered in the Framework Plan for the content and tasks of kindergartens in force in Norway, and it was recommended to establish a "parents' council" and "the co-ordinating committee" for parent-teacher partnerships (Directorate for Education and Training, 2017, p. 29-30). The National Curriculum Framework in South Africa has no statement on establishing parent-teacher partnerships (Department of Basic Education, 2015). Partnerships such as "visits to children's houses, group and individual parent meetings" (Ministry of National Education, 2013, p. 50), emphasized in the preschool education program implemented in Türkiye, seem insufficient. Since it may be challenging to establish parent-teacher partnerships in countries with low-income or low pre-primary education rates, such as Türkiye and South Africa, cooperation with educational institutions and relevant social actors can be made to design and implement such supports.

Considering the results of the present study, which showed that literacy and numeracy activities at home and children's ability to perform literacy and numeracy tasks at the beginning of primary school positively contribute to later mathematics and science success, it was concluded that educational interventions to improve students with difficulties in early literacy and numeracy skills should be developed and implemented. Educational intervention is intended by early intervention programs that integrate information and skill learning to create competency or alter practice behavior (Wilkes and Bligh, 1999). Niklas, Cohrssen, and Tayler (2016) and Vukovic, Roberts, and Wright (2013) reported that these educational interventions improved preschool children's abilities and academic achievement. Therefore, early intervention programs can be developed for children who have not yet started primary school, which can help them improve their early literacy and mathematics skills by making use of good examples from other countries but also by taking into account the characteristics of their country/culture. These early intervention programs can provide easy-to-use and effective printed and visual resources. For these resources to be used efficiently, children and parents can be provided with continuous and proactive support by preschool teachers.

Finally, some implications can be made for future research. Future research may consider cultural factors related to early literacy and numeracy skills. The causal relationships between this study's dependent and independent variables, a cross-sectional study by the nature of TIMSS-2019, cannot be revealed. Longitudinal and experimental studies can be designed to investigate possible causal relationships between predictor and predicted variables.

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## **TÜRKÇE GENİŞ ÖZET**

### **Erken Akademik Beceriler ve Sonraki Akademik Başarı Arasında Bağlantılar Kurmak: Ülkelerarası Bir Analiz**

#### **Giriş**

Eğitim programının çıktılarının temel göstergelerinden birisi akademik başarıdır. Akademik başarı; öğrencinin, öğretmenin, eğitim programının ve eğitim kurumunun önceden belirlenmiş eğitim hedeflerine ne ölçüde ulaştığını gösterir (Kpolovie, Joe & Okoto, 2014). Akademik başarının yüksek olduğu ölçüde öğrencilerin program kazanımlarını edindikleri söylenebilir. Akademik başarı; genel olarak, bir öğrencinin okulda ve toplumda başarılı olmasını sağlayan iletişim (konuşma, okuma, yazma), matematik, fen bilimleri, sosyal bilimler ile ilgili düşünme becerilerini ve yeterliklerini ifade eder (Lindholm-Leary & Borsato, 2006). Bununla birlikte akademik başarı; geçmişteki ve güncel durumdaki aile, toplum ve okul deneyimlerinin kümülatif bir işlevidir (Rivkin, Hanushek & Kain, 2005). Bu deneyimlerden birisi öğrencilerin erken akademik becerileridir.

Erken akademik beceriler, okul öncesi dönemde yer alan okuma yazma becerileri ve matematik becerileridir (Uyanık & Kandır, 2010). Erken akademik beceriler, harfleri tanıyabilme ve ses birimsel farkındalık gibi temel okuryazarlık yetenekleri ve bunun yanında sayılar bilgisi ve sayıların sırasını anlama gibi aritmetik yetenekleri içerir (Rabiner, Godwin, & Dodge, 2016). Alanyazındaki bazı çalışmalar, akademik başarının öğrencilerin erken akademik becerileri kazanmasıyla ilişkili olduğunu göstermektedir (Duncan & diğ., 2007; La Paro & Pianta, 2000; Murrah III, 2010; Pagani, Fitzpatrick, Archambault & Janosz, 2010; Rabiner & diğ., 2016; Romano, Babchishin, Pagani & Kohen, 2010; Stevenson & Newman, 1986).

Erken akademik becerilerin uzun vadeli akademik başarıyı nasıl etkilediğine dair alanyazında kapsamlı araştırmalar olmasına rağmen, bu alandaki bilgi birikiminde önemli boşluklar olduğu söylenebilir. Bu boşluklardan biri, erken akademik becerilerin sonraki fen başarısıyla olan ilişkisinin ortaya koyulmasındaki kısıtlılıklardır ki alanyazında Murrah III (2010) tarafından yapılan çalışma dışında bir çalışmaya rastlanılmamıştır. Bununla birlikte, erken akademik becerileri yordayıcı olarak kabul eden çalışmalar yüksek gelirli ve gelişmiş olarak nitelendirilen ülkelerde yürütülmüş ve bu sınırlandırmanın ötesine geçmemiştir (Duncan & diğ., 2007; Murrah III, 2010; Pagani, Fitzpatrick, Archambault & Janosz, 2010; Rabiner & diğ., 2016; Romano, Babchishin, Pagani & Kohen, 2010). Bu yönüyle tartışmaya açık olsalar da bu çalışmalarda vurgulanan akademik başarıda erken akademik becerilerin önemi göz önüne alındığında benzer bir çalışmanın kültürel, coğrafi ve eğitim seviyesi olarak farklı ve birbirinden bağımsız nüfuslarla yapılması, sonuçların genelleştirilebilirliğine ve farklı açılardan değerlendirilebilirliğine yardımcı olabilir. Bu çalışmada, öğrencilerin erken okuma yazma ve

matematik becerileri ile matematik ve fen başarıları arasındaki ilişkiye odaklanılmakta ve bu kapsamda öğrencilerin erken okuma yazma ve matematik becerilerinin sonraki matematik ve fen başarıları üzerindeki yordayıcılığını ülkeler arası karşılaştırmalı olarak incelemek amaçlanmaktadır. Bu amaç doğrultusunda iki araştırma sorusu cevaplanmaya çalışılmıştır: Norveç, Güney Afrika ve Türkiye'deki beşinci sınıf öğrencilerinin erken okuryazarlık ve matematik becerileri;

1. Sonraki matematik başarılarını yordamakta mıdır?
2. Sonraki fen başarılarını yordamakta mıdır?

## Yöntem

Bu çalışma ilişkisel tarama türünde nicel bir araştırmadır. Çalışmanın örneklemini, TIMSS-2019'a Norveç, Güney Afrika ve Türkiye'den katılan beşinci sınıf öğrencileridir. Norveç'ten 2327, Güney Afrika'dan 9794 ve Türkiye'den 3694 beşinci sınıf öğrencisinin verileri analiz edilmiştir. Araştırmanın verileri, "TIMSS ve PIRLS uluslararası çalışma merkezindeki anket geliştirme ekibi ve TIMSS anket maddesi inceleme komitesinin iş birliği ile geliştirilen Erken Okuryazarlık ve Matematik Etkinlikleri ve Erken Okuryazarlık ve Matematik Görevleri ölçekleri" ile öğrencilerin matematik ve fen testlerinden elde edilmiştir (Hooper, Mullis, Martin, & Fishbein, 2017, p. 59). Her iki ölçek de öğrencilerin aileleri tarafından cevaplandırılmıştır. TIMSS-2019 uygulamasına ait olan bu veriler, TIMSS & PIRLS'in internet sitesinde halka açık olarak sunulmaktadır. Elde edilen verilerin analizinde çoklu doğrusal regresyon analizi kullanılmıştır. Verilerin analizleri IDB Analyzer yazılımı ile yapılmıştır.

## Bulgular

Bulgular; erken okuryazarlık ve matematik becerilerini kullanarak yüksek, orta ve düşük başarılı ülkelerdeki öğrencilerin sonraki matematik ve fen başarılarını tahmin etmenin mümkün olduğunu göstermektedir. Erken akademik beceriler, matematik başarısındaki toplam varyansı her ülke için %9'dan (Güney Afrika) %20'ye (Türkiye) değişen oranlarda açıklamaktadır. Ülkeler arasında açıklanan varyans farkı, çalışmanın çok düzeyli modelinin Türkiye için diğer ülkelere göre daha etkili olduğunu göstermiştir. İlkokula başlarken erken matematik görevlerini yapabilme, tüm ülkelerde matematik başarısını pozitif olarak öngören bir değişkendir. Bu nedenle, ilkokula ilk başladığında çeşitli matematik görevlerini daha iyi bir şekilde yerine getirebilen öğrencilerin matematik puanları daha yüksek olmuştur. Çocukları ilkokula başlamadan önce ebeveynlerin matematik etkinliklerine daha sık katılması, Norveç ve Güney Afrika'da matematik başarısını pozitif yönde yordamıştır. Ancak, bu değişken Türkiye'deki öğrencilerin matematik başarısı için anlamlı bir yordayıcı değildir. Çocukları ilkokula başlamadan önce ebeveynlerin okuma yazma etkinliklerine daha sık katılması, matematikte orta ve düşük düzeyde başarılı ülkeler olan sırasıyla Türkiye ve Güney Afrika'da matematik başarısını pozitif yönde yordamıştır. Ancak, matematik başarı sıralamasında üst sıralarda yer alan Norveç'te, söz konusu değişken ile matematik başarısı arasında bir ilişki bulunamamıştır. Erken akademik beceri değişkenleri arasında okula başlangıçta okuma yazma görevlerini yapabilme değişkeni sadece Türkiye için matematik başarısını pozitif olarak yordamıştır.

Erken akademik beceriler, fen başarısındaki toplam varyansı her ülke için %7'den (Norveç) %24'e (Türkiye) farklı değerlerde açıklamaktadır. Ülkeler arasında açıklanan varyans farkı,

çalışmanın çok düzeyli modelinin fen başarısı için de Türkiye için diğer ülkelere göre daha etkili olduğunu göstermiştir. Okul öncesi erken okuma yazma etkinliklerine ebeveynlerin katılımı, tüm ülkelerde fen başarısını pozitif olarak yordamaktadır. Bu nedenle, erken okuma yazma etkinliklerine ebeveyni daha sık katılan öğrencilerin fen puanları daha yüksek olmuştur. Çocukları ilkokula başlamadan önce ebeveynlerin matematik etkinliklerine daha fazla katılması, Norveç ve Güney Afrika'da fen başarısını pozitif yönde yordamıştır. Ancak, bu değişken Türkiye'deki öğrencilerin fen başarısı için anlamlı bir yordayıcı değildir. Çocukların ilkokul başlangıcında matematik görevlerini yapabilmesi, fende orta ve düşük düzeyde başarılı ülkeler olan sırasıyla Türkiye ve Güney Afrika'da fen başarısını pozitif yönde yordamıştır. Ancak, TIMSS-2019 fen başarı sıralamasında üst sıralarda yer alan Norveç'te, söz konusu değişken ile fen başarısı arasında bir ilişki bulunamamıştır. Erken akademik beceri değişkenleri arasında okula başlangıçta okuma yazma görevlerini yapabilme değişkeni, matematik başarısında olduğu gibi sadece Türkiye için fen başarısını pozitif olarak yordamıştır.

### **Tartışma, Sonuç ve Öneriler**

Çalışmada ulaşılan sonuçlar erken akademik becerilerin sonraki matematik başarısının istatistiksel olarak anlamlı yordayıcısı olduğunu göstermektedir. Bu sonuç, alanyazındaki çalışmaların (Duncan & diğ., 2007; Huang, Zhang, Liu, Yang & Song, 2017; Hwang, 2020, LeFevre, Polyzoi, Skwarchuk, Fast & Sowinski, 2010; Murrell III, 2010; Pagani & diğ., 2010; Rabiner & diğ., 2016; Romano & diğ., 2010; Zhu & Chiu, 2019) sonuçlarıyla uyumludur. Erken matematik becerileri, matematiğe ilgi ve matematikte kendine güven ile önemli ölçüde pozitif ilişkilidir (Balala, Arepattamannil & Cairns, 2021) ve matematikte kendi bilgisine ve becerilerine güvenen ve matematiği ilginç bulan öğrencilerin matematik puanları diğerlerine göre daha yüksektir (Akyüz, 2014; Arıkan, Van de Vijver & Yağmur, 2016; Tavşancıl & Yalçın, 2015; Yavuz, Demirtaşlı, Yalçın & Dibek, 2017). Buna ilave olarak, erken matematik görevlerini başarılı bir şekilde uygulama ve tamamlama, daha sonraki matematik başarılarına katkıda bulunabilecek matematik öz-yeterliliklerini artırma fırsatları sunabilir (Zhu & Chiu, 2019). Ebeveynlerin erken okuryazarlık etkinliklerine katılımının teşvik ettiği konuşmalar ve etkileşimler; çocukların kelime dağarcığının artması, kelime çözme ve kelime tanıma gibi belirli beceriler ve tutumlar geliştirmelerini sağlar (Sénéchal & LeFevre, 2002). Bu beceri ve tutumları gelişmiş olan öğrenciler; matematiksel olguları, kavramları, prosedürleri, kavramsal anlayışı, alışılmamış durumları, karmaşık bağlamları, çok adımlı problemleri, verileri okumaları ve yorumlamaları daha kolay anlayabilir. Bu nedenle, erken matematik etkinliklerine ebeveynleri daha sık katılan ve okula girişte matematik görevlerini daha iyi yapan öğrencilerin sonraki matematik başarıları daha yüksek olabilir.

Araştırmanın bir diğer sonucu, erken akademik becerilerin sonraki fen başarısının istatistiksel olarak anlamlı bir yordayıcısı olduğudur. Genel bir bakış açısıyla, fen öğretim programlarının içeriğinin öğrencinin kendi vücudu, sağlığı ve hastalıkları gibi sağlıkla ilgili olgular, açıklanamayan uzay ve fenomenler, cinsellik ve üreme, çevreyle ilgili sorunlar, biyolojik çeşitlilik gibi popüler ve gerçek yaşamla doğrudan bağlantılı konularla ilgili olduğu söylenebilir (Jidesjö, Oscarsson, Karlsson & Strömdahl, 2009). Dolayısıyla, fen dersi günlük hayatın bir parçasıdır ve hangi yaşta olursa olsun, bütün insanlar içinde yaşadıkları dünyayı yöneten temel fen prensiplerini bilmek isterler (Andrée, 2005; Aniashi, Okaba, Anake & Akomaye, 2019; Gürdal, 1992). TIMSS-2019 fen testinin kapsamı da bu içerikle örtüşmektedir (Mullis, Martin, Foy, Kelly

ve Fishbein, 2020). Okul öncesi okuma ve matematik etkinliklerine ebeveynleri sıklıkla katılan öğrenciler ebeveynleriyle iletişime geçerek merak ettikleri ve öğrenmek istedikleriyle ilgili sorular sormaya ve araştırmalar yapmaya başlarlar (Hayes, Berthelsen, Nicholson & Walker, 2018; Lin & diğ., 2019; Uyanık & Kandır, 2010). Ebeveynleriyle birlikte günlük hayatın bir parçası olan fen konularıyla ilgili olarak yazılı ve görsel kaynaklardan tarama yapma ve sorularına cevaplar bulma gibi etkinlikler, çocukların hem fenle ilgili bilgisini hem de fene yönelik ilgisini artırabilir. Bu durum, okul öncesi okuma yazma etkinliklerine katılımın öğrencilerin fen başarısını artırmasına katkıda bulunmuş olabilir.

Çalışmanın sonuçlarının eğitim programları ve uygulamaları için önemli çıkarımları vardır. Güney Afrika ve Türkiye'nin okul öncesi eğitim programlarında ve Norveç'in anaokulları için çerçeve planında, erken akademik faaliyetlere ve görevlere veli katılımının önemi vurgulanmaktadır (Department of Basic Education, 2015; Directorate for Education and Training, 2017; Ministry of National Education, 2013a). Bununla birlikte, Norveç'te ve Türkiye'de uygulanan okul öncesi eğitim programlarında erken akademik etkinlik ve görevlerin bulunmadığı (Directorate for Education and Training, 2017; Ministry of National Education, 2013a); Güney Afrika'daki okul öncesi eğitim programında ise öğrenme ve gelişim alanları için açıkça yazıldığı (Department of Basic Education, 2015) görülmektedir. Diğer iki ülkeden farklı olarak Türkiye'de, erken akademik etkinlik ve görev örnekleri, okul öncesi eğitim programı ile bütünleştirilmiş olarak hazırlanan Aile Destek Eğitim Rehberi'nde yer almaktadır (Ministry of National Education, 2013b) ancak bu örneklerin sayısının az olduğu ve Aile Destek Eğitim Rehberi'nin ebeveynlerden ziyade öğretmen merkezli olduğu söylenebilir. Öğrencilerin ilkökul sonundaki matematik ve fen başarısını artırmak için, Güney Afrika için geliştirilen okul öncesi eğitim programında ve Türkiye'deki Aile Destek Eğitim Rehberi'nde yer alan evde ebeveynlerin katılabileceği etkinlik ve görevler sayıca zenginleştirilerek, içeriği geliştirilerek ve ebeveyn merkezli olacak şekilde düzenlenerek okul öncesi eğitim programlarına dahil edilebilir. Çocukların okul öncesi matematik görevlerini yapma becerilerini geliştirmek için, bu çalışmanın kapsamındaki ülkelerde uygulanan okul öncesi eğitim programlarında yer almayan, somuttan soyuta geçişi kolaylaştırabilecek oyun tabanlı bilgisayar destekli öğretim kullanımına yönelik etkinliklere eğitim programlarında yer verilebilir.

Evde okuma yazma ve matematik etkinliklerinin ve çocukların ilkökulun başında okuma yazma ve matematik görevlerini yerine getirme becerilerinin sonraki matematik ve fen başarısına olumlu katkı yaptığını gösteren bu çalışmanın sonuçları göz önüne alınarak, bu konuda güçlük çeken öğrencileri geliştirmeye yönelik eğitimsel müdahalelerin geliştirilmesi ve uygulanması gerektiği sonucuna varılmıştır. Eğitimsel müdahale ile kastedilen, yeterlilik oluşturmak veya uygulama davranışını değiştirmek için bilgi ve beceri kazanımını birleştiren erken müdahale programlarıdır (Wilkes & Bligh, 1999). Niklas, Cohrssen ve Tayler (2016) ve Vukoviç, Roberts ve Wright (2013) erken müdahale programları gibi eğitimsel müdahalelerin okul öncesi çocukların yeteneklerini ve akademik başarılarını geliştirdiğini bildirmiştir. Ayrıca; çalışmaya dahil edilen ülkelerin okul öncesi eğitim programlarında erken akademik görevlerini yapmakta zorluk çeken öğrencileri desteklemeye yönelik bir müdahale programından bahsedilmemektedir. Türkiye'deki okul öncesi eğitim programında özel gereksinimli çocukları desteklemede dikkat edilmesi gereken noktalar belirtilmektedir fakat erken akademik görevlerini yapmakta zorluk çeken öğrenciler bu kapsamda değerlendirilmemektedir. Bu nedenle, henüz ilkökula başlamamış çocuklara yönelik erken akademik becerilerini geliştirmelerine yardımcı olabilecek, diğer ülkelerdeki iyi örneklerden yararlanılarak ve

ülkelerinin kültürel özellikleri de dikkate alınarak erken müdahale programları tasarlanabilir ve bunlara eğitim programlarında yer verilebilir. Bu erken müdahale programlarında okul öncesi yaş grubundaki çocuklara erken akademik görevlerin öğretimi konusunda deneyimli bir öğretmen tarafından küçük grup çalışmalarıyla veya bireysel öğretim yoluyla destekleme çalışmaları yaptırılabilir. Bununla birlikte, bu çalışmalarda kullanılacak, kullanımı kolay ve etkili basılı ve görsel kaynaklar verilebilir. Bu kaynakların verimli kullanılabilmesi için okul öncesi öğretmenleri tarafından hem çocuklara hem de ebeveynlere sürekli ve proaktif destekler (ebeveynler yardım istemek zorunda kalmadan, önetkin şekilde sağlanan destekler) verilmesi sağlanabilir.

Mevcut çalışmanın sonuçları, çalışmanın sınırlılıkları ile birlikte değerlendirilmelidir. İlk olarak, erken akademik becerilerle ilgili sınırlı sayıda değişken çalışmaya dâhil edilmiştir. Ayrıca bu değişkenler veliler tarafından TIMSS-2019'da yanıtlanan ölçeklerden elde edilmiştir. Huang ve diğ. (2017), ebeveynlerin ölçeklere verdikleri yanıtların sosyal istenirlikten etkilenebileceğini vurgulamaktadır. İkinci olarak, TIMSS-2019 öğrencilerin okuduğunu anlama becerilerine yönelik bir test uygulamadığından öğrencilerin okuma yazma becerileri puanları bulunmamaktadır. Bu nedenle erken akademik becerilerin öğrencilerin daha sonraki okuma yazma başarılarını yordayıp yordamadığı incelenememiştir. Üçüncüsü, ebeveynlerin çocuklarının erken okuryazarlık ve matematik etkinliklerine katılımının doğası ve kapsamı bir ülkeden diğerine önemli ölçüde değişebileceğinden, çalışmanın bulgularının ülkeler arası genellenebilirliği sınırlı olabilir. Ayrıca, TIMSS-2019'un doğası gereği kesitsel bir çalışma olan bu çalışmanın bağımlı ve bağımsız değişkenleri arasındaki nedensel ilişkiler ortaya konulamamaktadır. Farklı değişkenler arasındaki olası nedensel ilişkileri araştırmak için boylamsal ve deneysel çalışmalar tasarlanabilir.



## The Search for an Effective Curricular Change Adoption in Foreign Language Education: A Meta-Synthesis

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### Abstract

There is a rich body of studies on the implementation problems of curricular changes comprising more student-centred methodologies in English as a foreign language education around the world. Focusing on these global-wide studies within the context of the Ecological System Theory, this meta-synthesis aims to identify the common factors that hinder the curricular change implementation and to reveal the final synthesis that will lead to effective curricular change adoption. Hence, 10 studies from seven country settings (Türkiye, Japan, Colombia, South Korea, China, Vietnam, and Bangladesh) were included in the sample of the study. The analyses uncovered similar factors such as teachers' qualifications at the micro-level, lack of support and infrastructure at the meso-level, and lack of guidance or misalignment between curricular change and high-stakes testing policy at the macro-level for blocking the implementation. The synthesis indicated weaknesses between the systems from macro to micro, which resulted in the lack of interactions, as well as the coordination needed for the curricular change adoption. When they are improved, the connection between the systems will be built and all the needed contexts will be structured for the adoption. Consequently, the implications for the interaction improvement are provided.

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## Introduction

Hoping to achieve a high level of English accuracy and fluency, several countries around the world propose curricular reforms, but they end up with strong implementation problems. The foreign language education knowledge-base includes many studies discussing the practical problems of curricular reforms comprising a communication-oriented approach with more student-centred methodologies in English as a foreign language (EFL) and they share the same argument that teachers have difficulty in implementation (see e.g., Adamson & Yin, 2008; Zare & Sarab, 2020). The approach adopted by curricular reforms is also called communicative language teaching (CLT) and it emphasizes students' needs, feelings, and motivation while language learning is facilitated through meaningful communication, interaction, and discovery (Richards, 2006). In this sense, it can be considered a radical reconstruction or modification of curricula. However, the implementation and adoption of these change attempts might not occur as they are intended, as in the case in many EFL studies mentioned above. Therefore, innovation studies revealing what happens when curricular changes meet reality are needed to develop curriculum management strategies (Hewitt, 2006). On the other hand, centring around students, the implementation, as well as the adoption of these reforms might also be shaped by the systems affecting students' development.

Since curricular change is nested in multiple systems within the broader environment that influences teaching, learning, and student outcomes (Taguma & Fernandez-Barrera, 2019), any curricular change implementation focusing on student outcomes should not ignore the systems or contexts enabling students' development. Thus, it is needed to argue curricular change within the context of the systems established around students, which is described through the ecological system theory by Bronfenbrenner (1979). The ecological system theory (EST) explains students' development through complex layers of the environment and the interaction between those layers around them (Bronfenbrenner, 1979).

By stressing the quality and context of students' surroundings (Härkönen, 2007), the EST explains students' development through the systems establishing inter-related structures (Bronfenbrenner, 1979). According to the theory, the classroom as an immediate setting around students (Bronfenbrenner, 1979) is the microsystem including interactions related to teaching and learning of curricular change (Taguma & Fernandez-Barrera, 2019). Extending the microsystem and providing the connection with it, school is the mesosystem in the EST (Bronfenbrenner, 1979). Therefore, classroom and school constituting the small picture in a curricular change process must be appreciated for how they influence curricular change.

Expanding the picture outside of school, region or state will be detected as the system affecting students' development. Named the exosystem, it involves policies that take place at the local and regional level within curricular change (Taguma & Fernandez-Barrera, 2019) and it links school as students' immediate contexts to other social settings in which they do not have an active role (Christensen, 2016). Offering multiple systems and relationships established through these systems, the EST explains students' development with a holistic perspective. Hence, the structures and events taking place at the exosystem level should not be disregarded to understand the change process. The system providing the big picture in a curricular change is the macrosystem, which is comprised of political, social, and economic factors or environments around students (Christensen, 2016). Thus, the macrosystem is the political context proposing curricular change within the educational system. Finally, the EST comprises

the chronosystem explaining the role of time in students' learning as well as the curricular change implementation (Taguma & Fernandez-Barrera, 2019). By considering the chronosystem within the big picture, change will be understood better since it might offer time points during a curricular change process such as before a mandated curriculum or after its first-year implementation. In short, a curricular change initiated to produce great effects on students' learning should be discussed within the systems influencing their learning as well.

On the other hand, EFL studies on the curricular changes around the world mostly depict the practical problems qualitatively (see e.g., Fang, 2012; Mwanza & Mkandawire, 2020) or evaluate them within the context of educational change or country setting (see e.g., Carles & Harfitt, 2013; Kaplan, Baldauf & Kamwangamalu, 2011). In other words, they have a lack of understanding of curriculum change implementation "as part of a larger eco-system" (The Organization for Economic Cooperation and Development [OECD], 2019, p. 14). In this regard, there is a need for an understanding of students' development and learning as a whole within a theory, i.e., EST. However, there is only one study discussing curricular change within the framework of EST (Taguma & Fernandez-Barrera, 2019) in the knowledge base, which is a review addressing all the disciplines around the world. On the other hand, the focus of curriculum analysis is shifting from curriculum redesign to curriculum implementation (OECD, 2019). Therefore, more studies offering ways for better implementation as well as adoption are needed. Furthermore, the increasing number of qualitative research requires another means of understanding how they contribute to that field (Erwin, Brotherson, & Summers, 2011). In this sense, more qualitative studies regarding the EST are needed for not only deepening the knowledge base but also proposing better ways for curriculum implementation. Hence, a meta-synthesis on a curricular change might be useful to uncover what has to be done for curricular change adoption. In other words, by examining the studies through a meta-synthesis, it is intended to reveal the common factors affecting curricular change implementation in EFL. It is aimed to reveal the ways for the adoption by understanding the small and big pictures of these changes. Moreover, curricular changes around the world mostly comprise CLT (see e.g., Adamson & Yin, 2008; Zare & Sarab, 2020) as mentioned earlier, therefore, it might be considered within the big picture as the global aspect of EFL education. On the other hand, the implementation process within the small picture is shaped by local constraints. In this regard, to understand curricular change, it should be discussed within the contexts of both educational change and the systems affecting students' development. Thus, focusing on the global-wide studies reflecting the curricular change process, this study aims to reach a comprehensible synthesis that could offer solutions for curricular change adoption. For this purpose, the questions below were raised:

1. What are the common factors hindering the effective curricular change implementation in EFL according to the previous studies?
2. What is the final synthesis that can guide an effective curricular change adoption?

### **Method**

This study employed a qualitative meta-synthesis, which produces results from a systematic, structured, and credible analysis of qualitatively acquired knowledge within a field with a synthesizing approach (Thorne, 2008). Hence, to seek expansion with an integrative conclusion and explore the ways for effective curricular change adoption in EFL, the processes

recommended by Howell-Major and Savin-Baden (2010) were conducted in the following headings:

### **Literature Search Procedure and Inclusion Criteria**

The literature search procedure undertaken from March 2021 to May 2021 included screening and selection processes. In the screening process, the articles were listed by using keywords and databases. The selection procedure includes the reading process, in which the articles were excluded based on the inclusion criteria. Accordingly, K-12 EFL curricular implementation, qualitative studies utilizing teachers as data sources, and the publication year were set as the inclusion criteria for the sample of this study since it was needed to be specific regarding the curricular change implementation level and the research design for the study focus. Also, the time period between 2010 and 2020 was set as another inclusion criterion as it was aimed to reach updated data. In the first screening phase, 2821 articles were listed (see Figure 1). In the selection process, their abstracts and titles were read first. Accordingly, 2728 articles were removed since they addressed curricular implementation in other disciplines; adopted quantitative or mixed-methods designs and they were published before 2010. Then, the remaining articles ( $n=93$ ) were read in detail so that all the articles meeting the inclusion criteria could be designated as potential articles. Accordingly, the articles adopting quantitative, mixed-methods, documentation, and review ( $n=12$ ); examining English teachers' curriculum and material usage ( $n=26$ ); utilizing students as data sources ( $n=2$ ) were excluded. Consequently, 53 articles were selected as potential studies. Meanwhile, the detailed reading process pointed out the need for another literature search procedure as the selected articles particularly focused on CLT initiation, and the keywords related to CLT initiations were not used in the first screening process. Therefore, "communicative language teaching" as a keyword was combined with "reform" and "innovation" by using the Boolean operators (OR and AND) in the second screening. In this process, 154 articles were screened and as most of them were duplicated, they were read in detail. Thus, five articles were found to be potential for the sample of the study. After that, a final detailed reading was conducted with 58 articles. Hence, the articles on teachers' material use, a professional development intervention, literacy education, higher education, and curriculum use ( $n=5$ ); using students as data sources ( $n=2$ ); prospective teachers as data sources ( $n=1$ ); adopting a survey design ( $n=3$ ); adopting a document analysis ( $n=1$ ); adopting mixed methods ( $n=4$ ); a review or an analysis on foreign language education ( $n=3$ ) published before 2010 ( $n=8$ ) were also excluded. The overall literature search procedure before ensuring the quality of the articles is displayed in Figure 1.

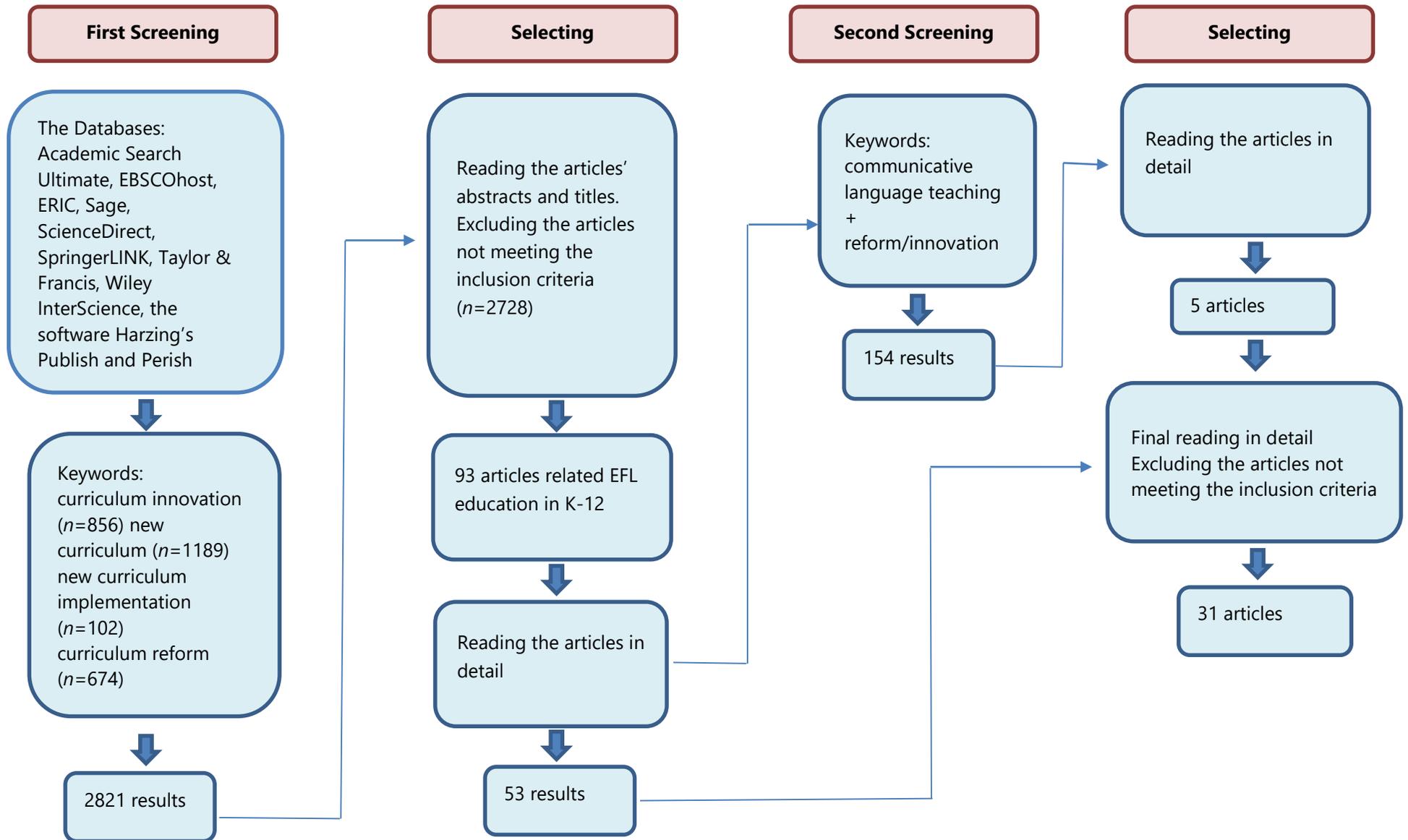


Figure 1. *The Literature Search Procedure of the Study*

## The Selection of the Studies

The quality of the methodology and credibility can be accomplished by assessing the congruence between the research question, methods, and efforts towards plausibility (Howell-Major & Savin-Baden, 2010). Therefore, the checklist (Erwin et al., 2011) including questions about the study's research problem, purpose, method, findings, discussions, and implications was utilized. Accordingly, the study scored as 11-15 is highly overall standards of quality and credibility; the one scored as 6-10 is moderate overall standards, and when it is scored as 1-5, it is low overall standards (Erwin et al., 2011). Hence, 31 articles were scored by two researchers separately. During this scoring process, one of the studies focusing on adult education was detected and excluded. When the scoring process ended, two researchers decided on the sample of the studies by calculating the means of the scores as well as sharing their opinions on the articles' details. Accordingly, 16 articles including studies from Türkiye, Japan, Colombia, South Korea, China, Vietnam, and Bangladesh were scored as highly overall standards of quality and credibility by two researchers. Then, the sample of the study was discussed through debriefing. Firstly, an article from each of them was included in the sample of the study ( $n=7$ ). Then, one latest article from Türkiye, China, and Japan was added to the sample as there was more than one article from these countries. Since the quality appraisal provided a good familiarity with the studies' findings, it was decided that 10 studies would be appropriate to present all the data. Hence, the study was conducted with 10 articles considered a comprehensive sample, which does not make the analysis impossible (Bondas & Hall, 2007; Howell-Major & Savin-Baden, 2010). The details about the sample of the study are presented in Table 1.

Table 1. *Studies Included in the Qualitative Meta-Synthesis*

	<i>Authors</i>	<i>Country</i>	<i>Purpose</i>	<i>Participants</i>
S1	Aguas (2020)	Colombia	To explore curriculum innovation from the key stakeholders' perspectives.	Eight teachers, two school administrators, two parents
S2	Dincer & Koç (2020)	Türkiye	To explore the needs and ideas of EFL teachers in the new system and the challenges that they might face.	Seven teachers
S3	Glasgow (2015)	Japan	To illustrate how teachers play a critical role in interpreting, negotiating, and resisting language policies in education, an area of language-in-education policy and planning.	Three teachers
S4	Liu & Wang (2019)	China	To glean the lived experiences of teachers in the mandated curriculum change.	Ten teachers
S5	Nguyen & Bui (2016)	Vietnam	To investigate the teachers' attitudes towards the government-initiated English policies in Vietnam and to what extent the teachers possess the capacity for change.	15 teachers

Table 1 (Cont.)

S6	Yeni-Palabıyık & Daloğlu (2016)	Türkiye	To provide a deeper understanding of the classroom implementation of the curriculum with an action-oriented approach.	Four teachers
S7	Rahman, Pandian & Kaur (2018)	Bangladesh	To explore the factors affecting English teachers' implementation of the CLT curriculum in secondary schools.	Eight teachers
S8	Trent (2014)	South Korea	To consider teachers' experiences of curriculum innovation by investigating identity.	Three teachers and three headteachers of the English department
S9	Underwood (2012)	Japan	To explore the personal, social, and context-related factors that Japanese teachers believe this could influence their teaching of grammar in the context of communication-oriented instruction, a central component in the new curriculum.	Ten teachers
S10	Yan (2015)	China	To pinpoint context-specific factors leading to the frequent occurrence of an implementation gap.	Ten senior teachers

\*S stands for the study included in the meta-synthesis.

### Data Analysis

The data analysis process was undertaken through the steps (Howell-Major & Savin-Baden, 2010). Firstly, all the findings from the articles were identified and moved into the tables developed through a Microsoft Excel sheet. Meanwhile, the themes [e.g., aligned curriculum and political aims (Aguas, 2020), teachers' perceptions of 'Teaching English in English' (Glasgow, 2015), balanced philosophies in language teaching (Liu & 2019), teachers' resistance to the new language policy implementation (Nguyen & Bui, 2016),], as well as codes [e.g., stress and anxiety (Dincer & Koç, 2019), topic-centered language usage and lexis (Yeni-Palabıyık & Daloğlu, 2016), teachers' needs and orientation to the curriculum (Rahman et al., 2018)] developed originally by the authors, were added to the tables. Also, the articles (S5, S8, S9, S10) reporting their findings through overarching themes were reread, and the codes under each theme were identified. Secondly, the themes of the articles were translated into the themes addressing the research questions, referring to the second-order interpretation before the final synthesis (Howell-Major & Savin-Baden, 2010). In other words, the original themes were translated into the new themes by reading the direct quotes from the studies. For instance, Aguas (2020, p.3468) reported the quote starting with "What we going to do now? How are we going to do this? ..." under the theme of the ability to face uncertainty and challenges. On

the other hand, Dincer and Koç (2019, pp. 32, 33) presented the code of stress and anxiety with the support of this quote; "I felt nervous at the beginning of the semester because I didn't know anything about the program ...". Hence, they were grouped or clustered under the lack of guidance in the second-order interpretation by considering them as a hindering factor. Moreover, the second-order interpretations together with the findings were rearranged to check for any misinterpretation or misfit. During this process, new codes (e.g., the need for locally developed materials and different teaching purposes) emerged since the quotes indicated the teachers' need for locally developed materials in addition to their struggle with instructions in terms of high-stakes testing. Then, the themes were organized within the context of the EST by putting the student in the centre of implementation. For instance, the themes generated for teachers were taken under micro-level factors as they are directly related to the implementation process around the student. Lastly, the third-order interpretation leading to the final synthesis was generated by rereading the data and second-order interpretations. Figure 2 exemplifies the analysis process in the study.

	A	B	C	D
	<b>Second-Order Interpretation</b>	<b>The Studies</b>	<b>Organizing the Second-Order Interpretation within Ecological System Theory</b>	<b>Third-Order Interpretation</b>
1	<b>1. Lack of guidance</b>			<b>Improving teachers' beliefs on the instrumentality of curricular change</b>
2	a. For implementation	S1, S2	<p>two teachers indicated the use of memorization as a technique for evaluation. Mete dictated question forms on transportation and required his pupils to memorize those forms. Nur required her students to write the words she delivered as handout for five-times. (S6)</p> <p>T5 pointed out that "There should be a training program at the beginning of the semester to inform us about the process and new program. Since there was not an informative activity, we had to design our courses in terms of our own knowledge and materials. Also, there wasn't any kind of information about the assessment, and again, we had to prepare our own evaluation exams." S2</p> <p>According to T-2: Students' errors should be corrected. Otherwise, they will be permanent. In written language, you cannot commit errors as marks will be deducted in the exam. In speaking, sometimes, minor errors can be tolerated; however, not often. (S7)</p>	Continuous support for constructing settings Dyadic communication at vertical level
3	b. For assessment in			
4	CLT	S6, S2,S7		
5	Lack of information about the curriculum	S3, S4, S6, S9, S10		
6	c. Inadequate professional development			
7	The qualifications of the teacher educators regarding CLT, multiculturalism, mixed-ability classes	S5, S7, S10		
8	The limited number of professional developments	S2, S5		
9	<b>2. Dealing with political aims</b>			<b>Macro level factors</b>
10	Politic expectations	S1		
11	Uncertainty	S3		
12	<b>3. Demanding curriculum</b>			<b>Improving teachers' beliefs on the instrumentality of curricular change</b> Coherence in message Dyadic communication at vertical level
13	Overloaded	S2, S5	macro level factors	
14	Mandated curriculum	S2, S5, S7		
15	Lack of time	S7, S9, S10		
	<b>4. Lack of support</b>			<b>Improving teachers' beliefs on the instrumentality of curricular change</b> Continuous support for constructing settings

Figure 2. The Examples of Second- and Third-Order Interpretations Arranged with Data and the EST

## Results

The results obtained from data analyses were presented based on the research questions. Accordingly, the results on the common factors hindering effective curricular change, and then, the final synthesis for effective adoption were explained in the following headings.

### The Common Factors Hindering Effective Curricular Change Implementation

The findings on the common factors hindering the effective curricular change implementation were organized under the micro-, meso-, and macro-level factors since the studies' findings indicated factors related to those levels (see Figure 3). Besides, any factors related to the exosystem level were not observed in the studies as they argued the implementation problems at the classroom, school, and national levels.

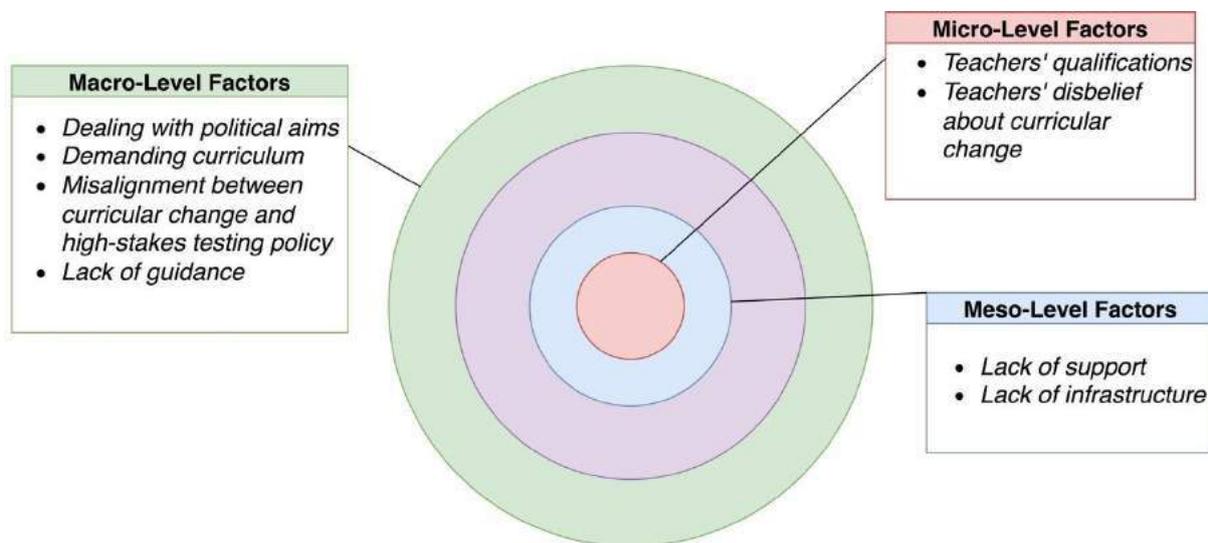


Figure 3. Common Factors Hindering the Effective Curricular Change Implementation Throughout the Systems

#### Macro-level factors.

**Dealing with the political aims.** The political expectations (Aguas, 2020) and uncertainty (Glasgow, 2015) constituted this theme. Teachers needed to understand the political expectation with each curricular change. *"Aligned curriculum, I think is an organized and planned syllabus that the government –with some specialists– have created for public schools in Colombia to follow."* (Aguas, 2020, p.3468). Furthermore, there should not be any uncertainty related to the curricular change message. *"Ryoko: I read about it in the newspaper[...]. In senior high school, English classes are taught only in English, not Japanese. That's my understanding if I understand correctly."* (Glasgow, 2015, p.159). In short, dealing with the political aims is a hindering factor at the macro-level.

**Demanding curriculum.** The studies also implied the problems arising with the curriculum itself (Dincer & Koç, 2020; Nguyen & Bui, 2016; Rahman et al., 2018; Underwood, 2012; Yan, 2015). Dincer and Koç (2020, p.35) explained the overloaded curriculum factor regarding students' age: *"In the new curriculum, there are 40 units, and some of the themes given in these units are too confusing and abstract for young learners. I think it is impossible to complete all of the units in one year, so it should be narrowed in terms of the cognitive abilities and needs of*

*young learners.*" However, in Nguyen & Bui (2016, p.94), teachers complained about this kind of problem regarding minority students: *"If I were able to change our current teaching practices, the first thing I would like to do is reduce the content and increase the time available for teaching to help minority students to learn all of the material presented in a class thoroughly..."* Additionally, a mandated curriculum seemed to be a factor hindering the implementation since teachers needed space to be more flexible or adapt the curriculum according to their students' needs. For instance; *"CLT emphasizes speaking in English, but we cannot do that often in the classroom. The classroom has its own demand. Mixing both languages makes it easier for our students to understand. Policymakers can say anything; it is us who knows how to adapt..."* (Rahman et al., 2018, p.1114). Thirdly, lack of time was another factor related to the curriculum itself. Since a demanding curriculum required more time, teachers had difficulty in allocating time for its implementation process, which was illustrated in the following: *"...we don't have enough time to do so with so many teaching tasks to accomplish and a set of exercises to mark."* (Yan, 2015, p.13). Hence, an overloaded curriculum, as well as a mandated curriculum, and a lack of time because of such a demanding curriculum constituted factors related to the curriculum itself at the macro-level.

**Misalignment between the curricular change and high-stakes testing policy.** Most of the studies emphasized that there was a misalignment between the curricular change and the high-stakes testing policy, which was a great obstacle to the adoption of the change (Dincer & Koç, 2020; Glasgow, 2015; Nguyen & Bui, 2016; Rahman et al., 2018; Underwood, 2012; Yan, 2015; Yeni-Palabiyik, & Daloğlu, 2016). For instance, Nguyen and Bui (2016, p. 94) conveyed teachers' confusion as in the following:

I am very concerned about the targeting of communicative English learning by our Ministry of Education, especially as no changes have been made to the evaluation method. What can I do, as just one teacher? When I, along with many other teachers, questioned the evaluation method in our national training workshop, our trainers told us not to blame our Ministry of Education, because they are trying to make changes. But I am forced to ask myself when these changes will happen.

Hence, teachers showed orientation towards the demands of the exams. *"... English is evaluated via tests in state examinations. Therefore, I want children to get used to the tests."* (Yeni-Palabiyik & Daloğlu, 2016, p.52). This orientation might be because of the parents' expectations. *"... parents are very strong, they want us to teach perfect English to pass the entrance exam, not practical English."* (Glasgow, 2015, p.157).

**Lack of guidance.** As mentioned earlier, any theme addressing the exosystem level was not generated. Actually, this kind of guidance is supposed to be within the city or region-level (exosystem); however, it was argued together with curricular change introduction at the national level (macro-level) in the studies. Thus, it was considered a macro-level factor. When teachers did not know how to implement curricular change, they might feel nervous and question the curricular change as stated in Dincer and Koç (2020, p.33): *"I felt nervous at the beginning of the semester because I didn't know anything about the program, and also there have been lots of new themes and units. So, I think that the curriculum is too heavy to apply with young learners, and it made me nervous."* Besides, teachers had difficulty in understanding how to assess students according to CLT, which was described best by Dincer and Koç (2020, p.35) again: *"...Since there was not an informative activity, we had to design our courses in terms of*

*our own knowledge and materials. Also, there wasn't any kind of information about the assessment, and again, we had to prepare our own evaluation exams.*" It was also observed in the studies (Rahman et al., 2018; Yeni-Palabıyık & Daloğlu, 2016).

Moreover, teachers interpreted the curricular change by themselves, which indicated their lack of information about the curriculum resulted from the lack of guidance (Glasgow, 2015; Liu & Wang, 2019; Underwood, 2012; Yan, 2015; Yeni-Palabıyık & Daloğlu, 2016). For instance, Glasgow (2015, p.156) reported a teacher's confusion about the first language usage with the curricular change:

Teacher: hmm... is it a rough (laughs) 80%?

Researcher: what do you think the other 20% is for?

Teacher: Grammar explanations, yeah, and... especially grammar explanations."

Also, practices similar to this kind of interpretation were observed in the studies, as well (Liu & Wang, 2019; Yan, 2015; Yeni-Palabıyık & Daloğlu, 2016).

Lastly, the studies indicated a lack of guidance because of the inadequate professional development activities at the macro-level (Dincer & Koç, 2020; Nguyen & Bui, 2016; Rahman et al., 2018; Yan, 2015). Accordingly, teacher trainers were not qualified enough in terms of CLT and multiculturalism, mixed-ability classes. *"All the training programmes advocate student-centred communicative approaches, but ironically the teacher trainers use didactic methods themselves. If they were in our position, how would they teach? They don't seem to understand our predicaments at all."* (Yan, 2015, p.13). Besides, Nguyen and Bui (2016, p.96) illustrated teachers' need for teacher trainers, who are qualified in multiculturalism and mixed ability classes as well: *"How can I make English more relevant to reality, how should I teach English to minority students who are not yet fluent in Vietnamese?"*. Also, the studies revealed the number of professional developments is inadequate. *"A two-week workshop every summer did not improve our teaching at all."* (Nguyen & Bui, 2016, p.96). *"There should be a training program at the beginning of the semester to inform us about the process and new programme..."* (Dincer & Koç, 2020, p.35). The lack of guidance resulting from inadequate professional development activities was uncovered as a factor hindering the curricular change adoption.

### **Meso-level factors.**

**Lack of support.** When teachers were not supported by their colleagues and students, they had difficulty in implementation (Aguas, 2020; Dincer & Koç, 2020; Rahman et al., 2018; Trent, 2014; Underwood, 2012; Yan, 2015). For instance, Trent (2014, p.71) exhibited a colleague's opposing ideas to innovative practices:

(Andrew) has brought with him some good teaching ideas, but his ideas are not so suitable in our (school) context. As I told him, tasks, language games, and communicative teaching cannot be easily applied in this school because the discipline is poor and in group work students get off task... games and activities like that are fine after school, our NET (native English-speaking teacher) does that in the English room already... we never use games and activities in class in this school... (Ronald)

Also, teachers needed students' support while implementing a curricular change: *"Students show unwillingness to participate in the tasks, and they would rather learn grammar by conventional GT (Grammar translation) method... If the tasks cannot be practiced, then how the*

*curriculum would, can be implemented?"* (Rahman et al., 2018, p.1113). Moreover, the administrators' support was also important in the curricular change implementation (Dincer & Koç, 2020; Underwood, 2012). *"School management always supports us while designing courses and it also supplies financial support for the materials. Additionally, the management informed parents about the new program, and it makes progress easier for us."* (Dincer & Koç, 2020, p.33). Hence, with the support of administrators, the implementation process might become easier for teachers.

Furthermore, the studies displayed that lack of communication, collaboration, and ownership might be another indicator of the lack of support at the school level. According to Aguas (2020, p.3469), building relationships at the school level was crucial, and it could be only achieved through communication: *"Because we have to be more connected, more communicative, and more interactive. We need to share more experiences."* Similarly, a good collaboration among teachers is needed for a decent implementation process, which was described in Trend (2012, p.69):

I tried some TBL (task-based learning) activities in some of my lower form classes... some teachers are like me, they agree with this approach, so we have started a small group that shares some materials and lessons. Some other teachers won't follow us, and those outside our group are locked in old-fashioned teaching ways...so we, our TBL group of teachers, just talk amongst ourselves and we don't interact with the other English teachers much in terms of sharing... later, they might accept our ideas, I hope the others might see the problems with boring rote learning and follow us.

Lastly, the lack of ownership might cause a lack of support at the school level as it was stated by Aguas (2020, p.3469): *"OK, the factors that influence the implementation of a new curriculum could be everybody's involvement with what the institution wants."* Therefore, communication, collaboration, and a sense of ownership constituted the needed support for a curricular implementation, which is expected from all the stakeholders at the school level.

**Lack of infrastructure.** Providing sufficient materials was crucial in implementing curricular change (Dincer & Koç, 2020; Underwood, 2012; Yan, 2015). *"... I have to design all of the courses by myself, and it is very challenging for me. If I get a coursebook, I can improve the language skills of students more easily."* (Dincer & Koç, 2020, p.34). Similarly, the quality of the materials was also important for a decent implementation process (Liu and Wang, 2019; Rahman et al., 2018). *"Needless to say, textbooks came with a CD that contains minimum listening skill exercises. However, we are still unable to practice it in the classroom because we do not even have the technology that is needed to play the CD."* (Rahman et al., 2018, p.1115). Besides, the teachers had difficulty implementing the new curriculum because they found the materials inappropriate for students' needs and cognitive levels as they were globally developed (Dincer & Koç, 2020; Rahman et al., 2018). *"When we first used the new material, we were merely sure about the type of contents to teach in the classroom. They were completely foreign to us as well as to the learners. Now, with several revisions, materials are more contextualized, making them more suited for the student's needs and learning process."* (Rahman et al., 2018, p.1115). Large classes constituting the lack of infrastructure were another factor hindering the implementation as CLT activities require space and time (Rahman et al., 2018; Yan, 2015). *"It is not realistic to have a creative and free classroom environment because the class is big. The facilities are*

*outdated, and we have to finish the required content each time.*" (Yan, 2015, p.13). Consequently, the lack of infrastructure was found to be a hindering factor at the meso-level.

### **Micro-level factors.**

**Teachers' qualifications.** The studies indicated teachers could not implement the curricular change effectively because of their lack of pedagogical knowledge about CLT (Nguyen & Bui, 2016; Rahman et al., 2018; Underwood, 2012; Yan, 2015; Yeni-Palabiyik & Daloğlu, 2016). For example, Nguyen and Bui (2016) stated teachers feel unconfident about teaching speaking and listening skills; whereas, Yan (2015, p.12) reported a direct quote; *"I want to use the communicative approach, but I don't know how to carry it out because I only know the theoretical terms."* Also, it was exemplified in a study by Yeni-Palabiyik and Daloğlu (2016) via classroom observation. Similarly, the teachers' lack of experience in CLT hinders the implementation, which was best illustrated in a study by Rahman et al. (2018): *"Initially, we did not know what CLT is; however, over the course of time, things have clearly changed..."* Another factor hindering an effective implementation is related to the teachers' status as being non-native speakers of English (Glasgow, 2015; Underwood, 2012), which is displayed as follows.

I think it's embarrassing for me, especially in class as a teacher. I want to use English all the time. But once I switch to Japanese I keep using Japanese, I don't know why, maybe embarrassing for me, because they know I am Japanese and I am not a native speaker and my pronunciation is bad so they, so some students who can speak English very much, how to say, they speak at a high speed and I cannot understand what they said. But they enjoy it, and I feel embarrassed (Glasgow, 2015, p.158).

Lastly, teachers' previous teaching experience or habits is also a factor affecting their curricular implementation. According to Aguas (2020), a new curriculum aroused teachers' previous teaching experience and made them redefine their professional and curricular practices, whereas Yan (2015) indicated teachers' pedagogical inadequacy resulted from their adherence to the long-established teacher-centred approaches. *"The focus of language learning has been traditionally grammar-based and emphasizes written form of language. My teachers were really strict and as a student, you just needed to listen, take notes, and obey."* (Yan, 2015, p.12). Similarly, the studies (Liu & Wang, 2019; Yeni-Palabiyik & Daloğlu, 2016) demonstrated teachers' form-focused instructions through the observations. For instance, *"After dealing with the key vocabulary of the text, Che (teacher) began to deal with the major grammar items of the lesson: verbs followed by -ing form and verbs followed by an infinitive."* (Liu & Wang, 2019, p.11). Consequently, it was found that the teachers could not implement the curricular change properly, and they followed the traditional instructions they were accustomed to.

**Teachers' disbelief about curricular change.** When teachers believe that the curricular change will not foster a student's improvement, they display an unwillingness to implement it, which was best illustrated in the following example: *"I feel grammar provides the basic framework for your communication. If you don't have solid grammar as the foundation, there is nowhere to build communication. If we get students to do tons of talking and tons of writing, but they are all wrong, then what's the point?"* (Liu & Wang, 2019, p.7). Besides, Nguyen and Bui (2016, p.93) reported this kind of disbelief concerning minority students: *"... Why, then, do we have to teach the language so intensively? Why are the students required to study so hard? We*

are forced to ask what students are gaining from these policies. Many minority students have asked me why they have to learn English." Furthermore, Rahman and colleagues (2018, p.1113) noted that reflecting teachers' needs on the curricular change is crucial for the implementation: "I came to know about the new curriculum after joining the school training session. Our needs were not reflected in the curriculum, particularly on the aspects of speaking and listening, which most of us have a problem in practicing." As seen in the quote, when the target of the curricular change differed from teachers' beliefs in what to teach, they had difficulty in the implementation.

### **The Synthesis for an Effective Curricular Change Adoption**

The second question, which is about the final synthesis to guide an effective curricular change adoption was answered through the findings of the first question. Accordingly, the findings on the first question indicated a lack of coordination resulting from weaknesses in the interactions among the systems affecting students' learning. Therefore, the synthesis pointed out that the improvement of the interactions is needed to enhance the coordination and establish the connection among the systems. In this context, the synthesis, as well as the findings on the first question noted two main interaction improvements. The first one is about teachers' interactions with curricular change at the micro-level. It is the personal aspect of the relationships that teachers develop towards curricular change. The second interaction is related to teachers' beliefs in the long-term instrumentality of the curricular change process. As a final synthesis, it was uncovered that the improvement of these interactions helps constitute not only good coordination through the systems but also the structures and contexts needed for implementation.

#### **Improving teachers' personal interactions with curricular change.**

Although most of the studies reported teachers' adoption of the relative benefit of curricular change at the beginning, they proposed their difficulty in implementation later (Dincer & Koç, 2020; Glasgow, 2015; Liu & Wang, 2019; Nguyen & Bui, 2016; Rahman et al., 2018; Underwood, 2012; Yan, 2015; Yeni-Palabiyik & Daloğlu, 2016). Then, teachers tended to turn to old practices and showed emotional and personal reactions towards change such as feeling *unconfident* (Nguyen & Bui, 2016, p.96), and *nervous* (Dincer & Koç, 2020, p.33). To improve their personal interactions with curricular change and to understand these reactions and their rationality, the findings on the micro-level factors implied a need for understanding the subjectivity of change, teachers' qualifications, and effects of socio-historical events on implementation.

The studies revealed that teachers interpreted curricular change differently during the introduction phase (Aguas, 2020; Dincer & Koç, 2020; Glasgow, 2015; Liu & Wang, 2019; Nguyen & Bui, 2016; Rahman et al., 2018; Underwood, 2012; Yan, 2015; Yeni-Palabiyik & Daloğlu, 2016). These interpretations were about their efforts to construct settings for implementation. However, the observations on their actual practices clearly showed how they failed in implementation (Liu & Wang, 2019; Nguyen & Bui, 2016; Rahman et al., 2018; Yan, 2015; Yeni-Palabiyik & Daloğlu, 2016), which might be explained through the subjectivity of change. Dealing with already different kinds of daily tasks, workloads, and problems, teachers face building new meanings with curricular change, and those meanings are expected to be compatible with the proposed change. In fact, curricular change at the micro-level has more different meanings than the targeted ones. These meanings attached to curricular change at

the micro-level cause the implementation to lurch, which is contrary to the macro-level expectations. Thus, understanding the subjectivity of change was revealed as one of the ways to improve teachers' personal interactions with curricular change.

Secondly, the studies presented that teachers' qualifications are the influential factors in an effective implementation (Aguas, 2020; Dincer & Koç, 2020; Glasgow, 2015; Liu & Wang, 2019; Nguyen & Bui, 2016; Rahman et al., 2018; Underwood, 2012; Yan, 2015; Yeni-Palabıyık & Daloğlu, 2016). The curricular change implementation is related to teachers' professional performance (Aguas, 2020, p.3468). Thus, the synthesis pointed to another requirement, which is the identification of teachers' qualifications before proposing a curricular change since it will help plan the interventions for a decent implementation and adoption.

Thirdly, teachers tended to practice their previous teaching experiences in contrast to the instruction prescribed in the curricular change (Dincer & Koç, 2020; Glasgow, 2015; Liu & Wang, 2019; Nguyen & Bui, 2016; Rahman et al., 2018; Underwood, 2012; Yan, 2015; Yeni-Palabıyık & Daloğlu, 2016). At this point, the synthesis implied the importance of the effects of socio-historical events within curricular change implementation. Having witnessed the same teaching methods for a long time, teachers might not change their teaching practices drastically. They might keep displaying the same manners and strategies as they are accustomed to. Shortly, the synthesis showed a need for understanding the subjectivity of change, teachers' qualifications, and the effects of socio-historical events on implementation to improve teachers' personal interactions with curricular change.

### **Improving teachers' beliefs in the instrumentality of curricular change.**

When teachers believe in the instrumentality of curricular change, they are likely to implement and adopt it. However, the results of the studies noted that teachers dealt with ill-structured settings instead of setting contexts for implementation, which caused them to question the instrumentality of the change (Dincer & Koç, 2020; Glasgow, 2015; Liu & Wang, 2019; Nguyen & Bui, 2016; Rahman et al., 2018; Underwood, 2012; Yan, 2015; Yeni-Palabıyık & Daloğlu, 2016). In this context, the synthesis indicated continuous support for constructing settings, dyadic communication at both vertical and horizontal levels, and coherence in the message.

The studies showed the need for continuous support to construct settings at two levels. One is at the mesosystem providing infrastructure as well as support at the school level (Aguas, 2020; Dincer & Koç, 2020; Liu & Wang, 2019; Rahman et al., 2018; Trent, 2014; Underwood, 2012; Yan, 2015; Yeni-Palabıyık & Daloğlu, 2016), and the other is at macrosystem enhancing the conditions to help teachers acquire needed new skills and knowledge for implementation (Dincer & Koç, 2020; Nguyen & Bui, 2016; Rahman et al., 2018; Yan, 2015). The teachers in the studies complained about insufficient materials, sources, and physical settings, and also, they did not see any support from their colleagues, administrators, and students. Without any support at the meso-level, teachers, who try to construct environments and settings for implementation, quit and go back to old practices. Therefore, the synthesis revealed that continuous support including sufficient resources and physical conditions and also appreciation with a sense of ownership from stakeholders will enhance the improvement of teachers' beliefs in the instrumentality of change. Subsequently, it will build not only the

needed coordination from beginning to end but also teachers' ties with curricular change regarding its effectiveness.

Moreover, the teachers needed continuous support provided from the macro-level through appropriate professional development activities (Dincer & Koç, 2020; Nguyen & Bui, 2016; Rahman et al., 2018; Yan, 2015). Without this kind of support at the macro-level, teachers might not establish beneficial interactions with curricular change at the micro-level, and then, they fail to implement it. Knowing curricular change as only the theoretical terms (Yan, 2015, p.12), they need help to see its long-term benefits through appropriate interventions at the exo-level or macro-level.

Another requirement to improve their beliefs in the curricular change instrumentality is dyadic communication at horizontal and vertical levels. The studies reported teachers' confusion about curricular change and the policy behind it (Aguas, 2020; Dincer & Koç, 2020; Liu & Wang, 2019; Rahman et al., 2018; Underwood, 2012; Yan, 2015; Yeni-Palabıyık & Daloğlu, 2016). When they do not establish a mutual understanding of change as a process at both meso- and macro-levels, they have difficulty in implementation. Therefore, the synthesis displayed both dyadic communication from micro-level to macro-level and the one between colleagues horizontally as they might ease the curricular implementation process.

Furthermore, the studies pointed to the problems with the curricular change message proposed by the macrosystem (Aguas, 2020; Glasgow, 2015; Nguyen & Bui, 2016; Rahman et al., 2018; Underwood, 2012; Yan, 2015; Yeni-Palabıyık & Daloğlu, 2016). In most of the countries included in this meta-synthesis, change policy was proposed at only the curricular level. However, the studies indicated that testing policy contradicted curricular change, which causes teachers to turn their backs on curricular change. Therefore, coherence in policy messages was included in the synthesis for improvement of teachers' belief in the instrumentality of curricular change. In other words, the synthesis indicated that from the testing policy to the college admission or teacher supervision, all should be rearranged according to curricular change at the macro-level so that the coherency of the proposed aims can be recognized at the micro-level.

As stated before, the EST notes inter-related structures and relationships within the systems (Bronferbrenner, 1979), so, any delay or problem that occurs in a system influences the others. The teachers' acceptance of the curricular change at the beginning does not mean that it will be implemented effectively, which was clearly indicated in the studies included in this meta-synthesis. When the interactions at the meso- and macro-levels are improved (see Figure 4), teachers' personal interactions with curricular change will be at the desired level at the micro-level. Then, the coordination between the systems will be ensured, as well.

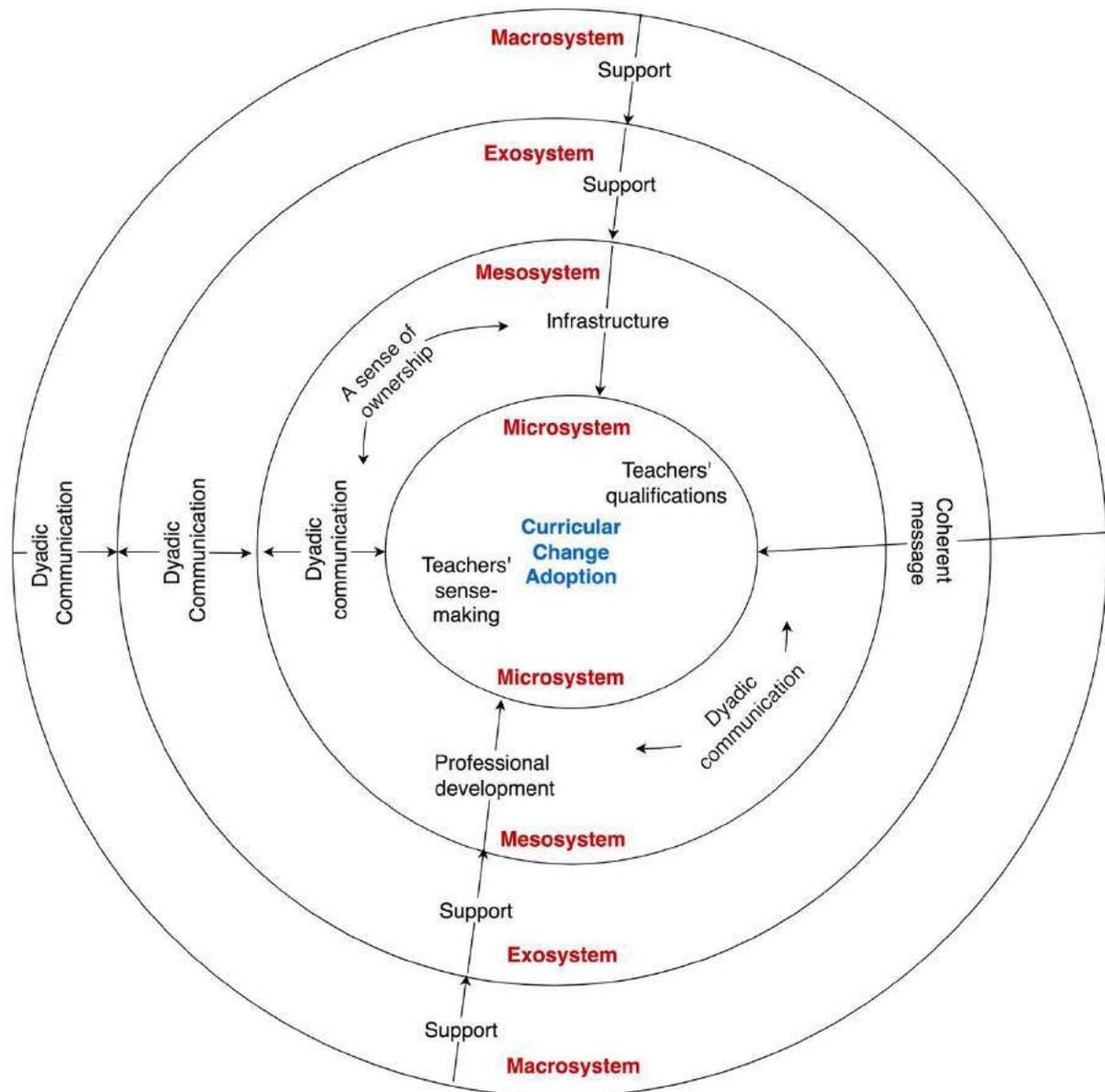


Figure 4. *The Interactions for an Effective Curricular Change Adoption Throughout the Systems*

### Discussion, Conclusion, and Implications

The curricular changes proposing a standardized understanding of EFL around the world note similar problems in implementation such as lack of guidance, support, infrastructures, and information. Clearly, they disregard students' non-standardized needs (Darling-Hammond, 2005) and learning environments. Viewing them through the lens of the EST revealed all the organizations from micro- to macro-levels are not structured and coordinated for the flow of the activities to start and sustain the curricular change implementation. In other words, the promotion of actions to increase acceptance and reduce the perceived uncertainty (Johannisson, 1987), is not fostered during curricular change implementation. Thus, teachers being in the centre of the implementation go back to their old practices (see, e.g., Kaplan et al., 2011; Taguma & Fernandez-Barrera, 2019).

In fact, from micro- to macro-levels, there is a need for building interactions and connections for effective curricular change adoption. Because of the inter-related structures within the systems (Bronferbrenner, 1979), any delay in any system affects the other, which consequently blocks the activity flow. Subsequently, it hinders teachers' sense-making around curricular change, which has a pivotal role in all kinds of connections between the systems (Taguma & Fernandez-Barrera, 2019). Some teachers might delay the implementation as they bring different kinds of meanings to the tasks (Darling-Hammond, 2005; Fullan; 2007; Hall & Hord, 2015). Accordingly, there is a need to devise ways to anticipate and facilitate change at the individual level (Hall & Hord, 2015). By doing this, the required network among teachers at the school level will be achieved, and then, the ownership of the curricular change will be ensured at the meso-level (Taguma & Fernandez-Barrera, 2019). Hence, from classroom to school, strong interactions for curricular change adoption will be built. Besides, no single school is likely to have all the expertise and resources needed to succeed in change, so external management in change outside of school is required (Hall & Hord, 2015). Through this external management from the exosystem, teachers' sense-making around curricular change will be shaped. Then, the mesosystem and exosystem interactions could be developed (Hall & Hord, 2015; Taguma & Fernandez-Barrera, 2019). Building the capacity of teachers and schools as well as investing in both individual and organizational learning will help curricular reform accomplishment (Darling-Hammond, 2005). By supporting this argument, it was found that only one study (Aguas, 2020) depicted relatively a good curricular change implementation in this meta-synthesis, and it is from Colombia. Besides, according to English First- English Proficiency Index (EF EPI) report (2020), most of the Latin American countries investing in teacher education in recent years see a real improvement in English proficiency in 2020.

Moreover, the macrosystem proposing curricular change should not be left outside of those system connections. The macrosystem needs to support teachers' sense-making process at all levels and conditions. To do this, the first and foremost thing is coherence. If the parts of the policy system conflict with one another, the implementation at the school level will be in different directions (Darling-Hammond, 2005). In this aspect, testing policy or teacher education systems should also be aligned with the curricular change. When teachers work in self-contradictory contexts such as a microsystem expecting the curricular change implementation and a mesosystem or exosystem demanding success in the high-stakes tests, they become cynical (Darling-Hammond, 2005). Also, resource allocation sends a coherent message about the priorities (Taguma & Fernandez-Barrera, 2019). Not only by allocating funds for professional development but also by providing appropriate materials and resources, the coherent message should be delivered from the macrosystem to the others. Hence, teachers will be convinced that the priority is curricular change implementation.

However, the roles of continuing communication, on-site coaching, and time for implementation (Hall & Hord, 2015) should not be disregarded in building coordination between the systems. The mutual understanding of curricular change might be achieved through communication at both horizontal and vertical levels, which is again related to teachers' sense-making. This communication should also reflect the interrelated dyadic ties (Johannisson, 1987) between the systems so that a real interaction can be built. Hence, not only the message delivered with curricular change will be understood better, but also the obstacles in the implementations will be detected and overcome. Then, the rationality behind

curricular change will be appreciated and the activity flow needed for the implementation will be ensured.

Additionally, each curricular change means new knowledge, skills, and methods to be implemented at the micro-level, and the policymakers at the macro-level need to understand that it takes time (Darling-Hammond, 2005; Hall & Hord, 2015). When it is acknowledged, the interventions or communication as stated so far will be long-term as well. Nevertheless, the macro-level expecting a sudden change usually has a short-term focus centring on one formal training session (Hall & Hord, 2015), which is the case in the majority of the studies in this meta-synthesis. On the other hand, the teachers' sense-making process around curricular change requires time and continuous support. Real organizational ties can be best achieved through realization and enactment rather than planning and controlling (Johannisson, 1987). However, in most of the studies included in this study, the curricular change has just been initiated. Therefore, all the efforts with a short-term focus might turn into a waste of time and resources. Even, teachers believing in curricular change at the beginning fail in implementation since their sense-making around curricular change is not shaped by the appropriate interactions as well as coordination.

Surprisingly, the studies included in this meta-synthesis are mostly from developing countries, only Japan is a developed country (United Nations, 2020) and the majority of them are Asian countries. It is clear that many Asian countries are constrained by rural underdevelopment and the population lives in poverty (Kaplan et al., 2011). Actually, there is a correlation between a country's level of human capital and its English proficiency (EF EPI, 2020). In other words, a country with skilful and competent individuals facilitating the creation of economic well-being, and thereby increasing economic growth (Keeley, 2007) clearly outperforms in English proficiency. Apparently, English learning attempt is only facilitated through curricular reforms, and this facilitation is not achieved due to low/no investments in setting structures for curriculum implementation in these countries. For instance, outdated initial teacher education or professional development activities in developing countries is revealed in several studies (see, e.g., Kaplan et al., 2011; Westbrook, et al., 2013). In fact, countries famous for top results in international tests such as PISA and TIMSS are notified of their support for teachers as professionals. Having top results in these tests, the countries like Canada, Finland, Australia, and Singapore have systems including multiple coherent and complementary policies on recruiting qualified individuals into the teaching profession; from preparation to retention (Darling-Hammond, 2017). Singapore as a developing country might be an exemption in this context; nonetheless, it is clear that a good teacher education policy is a must for also curricular change adoption. To ensure that teachers have sufficient capacity to implement a new curriculum, investments in the different stages of the teaching profession need to be made (Gouëdard, Pont, Hyttinen, & Huang, 2020). Furthermore, effecting change is difficult in developing countries since needed funding such as spending on resources, materials, and teachers' development activities are low (Kaplan et al., 2011; The World Bank, 2003). In this context, the countries investing in school-based professional development activities rather than one-shot in-service training might accomplish curricular change since successful initiations offer structural changes that provide the realignment of teachers' deeply rooted teaching practices and beliefs through teacher education, resources, and school-based teaching practices (Kazakbaeva, 2021). To conclude, the needed coordination for an effective

curricular change adoption starts with conceptualizing teacher education as a system (Darling-Hammond, 2017).

In conclusion, despite being from different country settings, the studies included in this meta-synthesis revealed similar factors such as teachers' qualifications at the micro-level, lack of support and infrastructure at the meso-level, and lack of guidance or misalignment between curricular change and high-stakes testing policy at the macro-level for blocking the curricular change implementation. However, any factor related to the exosystem level was not observed in the study, which can be explained through the top-down approach in the initiation of curricular changes. In many developing countries, language policy is seen as operating at macro-levels (Kennedy, 2011) and the studies depict implementation problems of this policy at micro- and meso-levels. In this sense, it can be interpreted that the recognition of the policy or curricular change message is not fostered at all levels (Kennedy, 2011). Hence, the message with curricular change is just handed down to teachers, and they are left with the responsibility of the implementation in the end. However, teachers require time and support to develop sense-making around curricular change. This sense-making process includes personal and instrumental interactions towards curricular change. To improve these interactions, the subjectivity of change, teachers' qualifications, and the effects of socio-historical events on implementation should be understood. Also, continuous support, dyadic communication both vertically and horizontally, and coherency in the message are needed. When they are supplied throughout the systems, the connection between the systems will be built and all the needed contexts will be structured for adoption. Otherwise, even if teachers believe in the curricular change at the beginning, they are likely to question the curricular change and turn their backs on it with great cynicism. Then, the needed contexts for students' learning within the systems will be damaged.

Overall, all the systems affecting students' learning should do their share to establish appropriate conditions and contexts for curricular change adoption. Every action to be taken before, during, or after a curricular change should be considered within a big system nesting many others as the EST proposed. The interactions throughout the systems should be built so strongly that the flow of actions for a decent implementation could be ensured.

Based on the findings, the suggestions can be offered mostly at the macro-level in this study because of top-down orientations in the curricular changes. Firstly, when designing a curriculum adopting a global approach, local realities and needs should be analysed better at the macro-level. Secondly, a coherent message should be delivered with curricular change. For a coherent message, the other policies such as testing policy, college admission, or teacher education policy should be addressed within the curricular reform as they have a role in the implementation. Also, curricular change should be supported by allocating funds for resources, materials, and interventions. The needed teacher education interventions should be planned according to curricular change demands. With lifelong learning understanding, school-based professional developments should be designed for effective curricular change implementation. The realization and enactment of curricular change rather than planning and controlling should be targeted. At the micro-level, teachers should appreciate curricular change efforts displayed in other systems, and they should be enthusiastic about being role models for both colleagues and students. Lastly, by being aware of the change as a process, they should display patience for curricular change effectiveness on students.

Focusing on only EFL studies might be regarded as a limitation in this study. On the other hand, the researchers can build a procedure and set boundaries considering the variety of literature to date in the knowledge base in the meta-synthesis (Howell-Major & Saven-Baden, 2010). In this sense, we as the researchers wanted to investigate the curricular change implementation process since our research interests centre around curriculum implementation and innovation studies. Therefore, innovation studies on other disciplines might be investigated for better understanding for further studies. Also, studies addressing successful curricular change implementations might be argued within the context of the EST. Besides, the arguments within the innovation studies such as interventions or change leadership might be analysed as well.

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## **TÜRKÇE GENİŞ ÖZET**

### **Yabancı Dil Eğitiminde Öğretim Programı Değişimlerinin Etkili Bir Şekilde Benimsenmesi Arayışı: Bir Meta-Sentez Çalışması**

#### **Giriş**

Yabancı dil olarak İngilizce eğitimi alanyazını öğrenci merkezli, iletişimsel yaklaşım temelli öğretim programı reformlarının öğretmenler tarafından benimsenemediğini ve uygulamada sorunlar yaşandığını ortaya koymaktadır (ör., Adamson & Yin, 2008; Zare & Sarab, 2020). Ancak herhangi bir öğretim programı değişimi; öğrenme ve öğretme sürecini etkileyen birden fazla sistemde iç içe olduğundan (Taguma & Fernandez-Barrera, 2019), öğrenci öğrenmelerine odaklanan program değişikliklerinin uygulanması bu sistemlerin dışında düşünülemez. Dolayısıyla öğretim programı değişimlerinin öğrencilerin çevresinde kurulan sistemler bağlamında, başka bir deyişle Ekolojik Sistem Teorisi (EST) çerçevesinde ele alınması yararlı olabilir. Bronfenbrenner (1979) tarafından ileri sürülen EST, öğrenci gelişimini onun etrafında yapılandırılmış karmaşık katmanlı ortamlar ve bu ortamlar arasındaki etkileşimler aracılığıyla açıklamaktadır. Temelde mikro, mezo, ekzo ve makrosistem olmak üzere dört ana sistem sunan EST; bu sistemler içerisinde birbiriyle ilişkili ve bağlantılı yapıların varlığından da söz eder (Bronfenbrenner, 1979). Kurama göre sınıf mikrosistem okul mezosistem, bölge ya da şehir ekzosistem ve ulusal bağlam da makrosistem olarak ele alınmaktadır. EST temele alınarak yabancı dil olarak İngilizce eğitiminde uygulamaya konulan öğretim programlarındaki değişimlerin öğretmenler tarafından benimsenmesine yönelik önerilerin geliştirilmesi için, bu alanda yapılmış nitel çalışmaların meta-sentez yöntemi kullanılarak ele alınması yararlı olabilir. Bu bağlamda çalışmada, yabancı dil olarak İngilizce dersindeki öğretim programı değişimlerini yansıtan farklı ülkelerdeki nitel araştırmalar ele alınmış ve aşağıdaki sorulara cevap aranmıştır:

1. Yapılan nitel araştırmalara göre, yabancı dil olarak İngilizce eğitiminde sunulan öğretim programı değişikliklerinin uygulanma sürecini engelleyen ortak etkenler nelerdir?
2. Bir öğretim programı değişiminin öğretmenler tarafından etkili bir şekilde benimsenmesi için yol gösterici son sentez nedir?

#### **Yöntem**

Bu çalışmada, meta-sentez yöntemi kullanılmıştır ve alanyazın taraması, çalışmaların seçilmesi ve veri analizi adımları (Howell-Major & Saven-Baden, 2010) takip edilmiştir. Buna göre Mart-Mayıs 2021 tarihleri arasında gerçekleştirilen alanyazın taramasında ilk aşamada listelenen çalışmalar ( $n=2821$ ) tekrarlı okumalar yoluyla elenmiştir. Bu aşamada dâhil edilme ölçütleri olan yayım tarihi (2010-2021 yılları arasında yayımlanan çalışmalar), yöntem (sadece nitel çalışmalar) ve odağa (K-12 EFL'de program değişikliği uygulamaları) göre elemeler

yapılmıştır ( $n=2728$ ). Kalan makaleler detaylı olarak okunmuş ve nicel, karma yöntem, doküman incelemesi ve derleme çalışmaları olan makaleler ( $n=12$ ), İngilizce öğretmenlerinin program ve materyal uygulamalarına odaklanan makaleler ( $n=26$ ) ile veri kaynağı olarak öğrencilerle yapılmış çalışmalar ( $n=2$ ) elenmiş ve böylece ilk detaylı okuma aşamasında 53 makale seçilmiştir. Diğer taraftan bu detaylı okuma aşaması, seçilen makalelerin özellikle iletişimsel dil öğretiminin (CLT) başlatılmasına odaklandığı göstermiş ve ilk taramada bununla ilgili anahtar kelimeler kullanılmadığı için yeni bir tarama yapılmasına ihtiyaç duyulmuştur. Bu nedenle, ikinci taramada Boole operatörleri (OR ve AND) kullanılarak "iletişimsel dil öğretimi", "reform" ve "yenilik" sözcükleriyle birleştirilmiştir. Böylece 154 sonuç listelenmiş ve bu sonuçların çoğunlukla daha önce listelenen sonuçlar olduğu gözlemlenmiş o nedenle detaylı okumaya tabi tutulmuştur. Böylece dâhil edilme ölçütlerine göre beş tanesinin uygun olduğu görülmüştür. Sonuç olarak yöntemi ve konusu nedeniyle bu çalışmanın odağı dışındaki diğer araştırmalar da elenerek ( $n=27$ ), ilk aşamadaki 53 ve ikinci aşamadaki beş çalışmadan seçilen toplam 31 araştırma, değerlendirilmek üzere ayrılmıştır. Daha sonra, bu 31 çalışma Erwin ve diğerleri (2011) tarafından geliştirilen nitel araştırmaların kalitesi hakkındaki kontrol listesi aracılığıyla iki araştırmacı tarafından ayrı ayrı puanlanmış ve ortalamaları alınarak, kalite ve inandırıcılık standartlarının üzerindeki çalışmalar belirlenmiştir ( $n=16$ ). Hem kritik veriyi sağlayacak hem de analizleri güçleştirmeyecek sayıda örnekleme ulaşmak üzere (Bondas & Hall, 2007; Howell-Major & Savin-Baden, 2010), çalışmaların detayları tartışılmış ve yedi ülkeye ait (Türkiye, Japonya, Kolombiya, Güney Kore, Çin, Vietnam ve Bangladeş) 10 çalışmayla meta-senteze başlanmıştır. Çalışmada veri doyumu sağlandığı için yeni bir çalışma eklenmemiştir. Son adımda veriler üç aşamada (Howell-Major & Savin-Baden, 2010) analiz edilmiştir. Öncelikle tüm çalışmaların tema, kod ve doğrudan alıntıları seçilerek bir Excel sayfasına yüklenmiştir. İkinci aşamada tümevarımcı ve bütünlendirici bir yaklaşımla, öğretim programı değişiminin uygulanmasını engelleyici ortak faktörler temalandırılmış, daha sonra bu temalar EST çerçevesinde kategorilendirilmiştir. Son olarak, önceki aşamada elde edilen sonuçların tekrarlı okumaları ve tartışmalarla senteze ait temalar belirlenmiştir.

## Bulgular

### Öğretim Programı Değişiminin Uygulanmasını Engelleyen Ortak Etkenler

Çalışmalardan elde edilen bulgular öğretim programı değişiminin engellenmesinde mikro, mezo ve makro düzeyde etkenler olduğunu göstermektedir. "Öğretmen nitelikleri" ve "öğretmenlerin program değişimine inançsızlıkları" mikro düzey faktörler olarak belirlenmiştir. Çalışmalar öğretmenlerin iletişimsel yaklaşımına yönelik yetersiz pedagojik bilgilerinden; deneyimsizliklerinden, anadilin İngilizce olmamasından ve geçmişteki farklı deneyimlerinden dolayı yeni programı sınıfta etkin bir şekilde uygulayamadıklarını göstermiştir. Mezo düzey faktörler ise "yetersiz destek" ve "yetersiz alt yapı" temaları altında toplanmıştır. Buna göre okul müdürü, meslektaş ve öğrenciler açısından destek eksikliğinden; okul düzeyinde değişimin sahiplenilmediğinden ve iletişimin yetersiz olduğundan; yetersiz, yerel bağlamda tasarlanmamış materyaller ve kalabalık sınıflardan kaynaklı uygulama problemleri ortaya çıkartılmıştır. "Politik hedeflerle uğraşma", "zorlayıcı öğretim programı", "merkezi sınav sistemi ve sunulan program arasındaki uyumsuzluklar" ile "yetersiz yönlendirme" makro düzeydeki temaları oluşturmaktadır. Öğretmenler, politik beklentiler ve belirsizlikten; öğretim programının yüklü ve merkezi olması ile yetersiz zamandan; öğretim programı ile merkezi sınav sisteminin

birbiriyle tutarsız olmasından; öğretmen eğitimcilerinin niteliklerinden ve yetersiz mesleki gelişim desteğinden dolayı yeni öğretim programını uygulayamamaktadır.

### **Öğretim Programı Değişimlerinin Etkili Bir Şekilde Benimsenmesine Yönelik Sentez**

Birinci araştırma sorusuna yönelik bulgular, öğrenci öğrenmesinde etkin olan sistemler arasındaki zayıf etkileşime ve bundan kaynaklanan koordinasyon eksikliğine işaret etmektedir. Buna paralel olarak, öğretmenlerin öğretim programı değişimlerinin uzun vadede yararlılıklarına dair inançlarının da zayıf olduğu belirlenmiştir. Dolayısıyla etkileşimler güçlendirilirse sistemler arasındaki gerekli koordinasyon sağlanacak ve böylece uygulama için gerekli bağlam ve yapılar kurulacaktır. Çalışmaların büyük bir çoğunluğu öğretmenlerin öğretim programının faydasına başta inandıklarını ancak daha sonrasında programa tepki gösterdiklerini ve eski uygulamalarına döndüklerini ortaya çıkarmıştır. Bu durumda öncelikle öğretmenlerin öğretim programına yönelik anlayış ve etkileşimlerinin geliştirilmesi için değişimin öznelliğinin, öğretmen niteliklerinin ve geçmiş yaşam deneyimlerinin uygulamadaki etkisinin daha iyi anlaşılması gerekmektedir. Ayrıca çalışmalar öğretmenlerin uygulamalar için gerekli bağlam ve yapıları kurmak yerine, kötü bir şekilde oluşturulmuş bağlamlarla uğraştıklarını göstermektedir. Öğretim programının uzun vadede yararlılığını ortaya koyacak etkileşimlerin oluşması için; sürekli destek, hem yatay hem de dikey olarak çift taraflı iletişim ve öğretim programı mesajında netlik gerekmektedir.

### **Tartışma, Sonuç ve Öneriler**

Standart olmayan öğrenci ihtiyaçları (Darling-Hammond, 2005) ve öğrenme ortamları göz ardı edilerek, küresel bir anlayışı merkeze alan yabancı dil olarak İngilizce dersi öğretim programı reformları farklı ülke bağlamında gerçekleşmiş olsa da, benzer faktörlerden dolayı uygulanamamaktadır. Nitekim bu çalışmada, mikro düzeyden makro düzeye kadar bütün sistemlerin uygulamayı sürdüreceği iletişim ve eylem akışını sağlayamadığı ortaya çıkmıştır. Oysa kolektif karar vermenin gerçekleştirilmesi için sistemler arasındaki eylem akışının sağlanması gerekmektedir (Johannisson, 1987). Diğer taraftan hiçbir okul ya da öğretmen yeni bir öğretim programını uygulayacak yeterliliklere sahip değildir; dolayısıyla dıştan bir destek sunulmalıdır (Hall & Hord, 2015). Ancak bu çalışmaya dâhil edilen bütün ülkelerde, öğretim programı değişimi makro düzeyde sunulmuş ve mikro düzeyde bir uygulamanın gerçekleşmesi beklenmiştir. Oysa öğretim programı reformları hem bireysel hem de kurumsal anlamda öğrenmeye yatırım yapıldığında başarıya ulaşmaktadır (Darling-Hammond, 2005). İlginçtir ki çalışmanın örneklemindeki ülkelerin çoğunluğu (Japonya hariç) gelişmekte olan Asya ülkelerindedir ve bu ülkelerde eski usul öğretmen eğitimlerinin sürdüğü birçok çalışmada ortaya çıkmakta (ör., Kaplan ve diğ., 2011; Westbrook ve diğ., 2013); materyal, kaynak ve öğretmen eğitimlerine ayrılan bütçelerin oldukça kısıtlı olması etkili bir değişimin gerçekleşmesini güçleştirmektedir (The World Bank, 2003).

Sonuç olarak, farklı ülkelerde gerçekleşmesine rağmen, öğretim programı değişimlerinin benzer faktörlerden dolayı uygulamada engellerle karşılaştığı ortaya çıkarılmıştır. Bu faktörler; mikro düzeyde öğretmen nitelikleri, mezo düzeyde destek ve alt-yapı eksikliği, makro düzeyde ise rehberlik eksikliği ve merkezi sınav politikaları ile program reformları arasındaki tutarsızlıklar olarak özetlenebilir. Ulaşılan sentez ise, öğrenci öğrenmesinde etken olan sistemler arasındaki etkileşimlerin zayıflığına ve bununla birlikte ortaya çıkan koordinasyon eksikliğine işaret etmektedir. Program değişimlerinin benimsenmesi için mikro düzeyden makroya kadar bütün

sistemlerin üzerine düşen görevleri yapması gerekmektedir. Örneğin, program tasarımlarında küresel yaklaşımların yanı sıra yerel ihtiyaçlar da göz önünde bulundurulmalıdır. Öğretim programı değişikliği, ilişkili olduğu merkezi sınavlar, öğretmen eğitimi gibi diğer politikalar bağlamında ele alınmalı; böylece yeni programa yönelik açık ve net bir mesaj sunulmalı, ayrıca yeterli kaynak ve bütçe de ayrılmalıdır. Yapılacak yeni çalışmalarda, diğer disiplinlerde meta sentezler yapılabilir ve başarılı program değişikliği uygulamaları EST bağlamında çözümlenebilir.





## The Opinions of Teacher Candidates about Critical and Analytical Thinking Course\*

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### Abstract

Higher-order thinking skills are of great importance for the welfare and development of a particular society since it depends on the quality of the decisions taken by individuals. Apart from families, teachers play a crucial role in equipping pupils with these skills such as critical, analytical, reflective or creative, but to do this, they should initially possess them, which requires a special training tailored for teaching these skills. This study focused on the effectiveness of "Critical and Analytical Thinking" course (CATC) taught at a bachelor of education program based on teacher candidates' opinions regarding course design, materials, delivery and strengths and weaknesses of the course. CATC was delivered online due to Covid 19 pandemic conditions; however, provided invaluable insights for future implementations regarding its delivery, activity types and evaluation system. The study was conducted as an analytical study by incorporating both quantitative and qualitative methods. The data were collected through Critical and Analytical Thinking Survey and written interview forms developed by the researcher. The participants were 78 teacher candidates who took the course and volunteered to participate in the study. The results revealed that CATC was highly influential on their individual and professional development and not only the theoretical but the practical elements of the course were beneficial for the teacher candidates. Based on the research results, this study concluded with a lesson proposal to be implemented both face-to-face and/or online with similar teacher candidates at education faculties.

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## Introduction

In order to respond to the rapidly changing conditions of the world, the knowledge transmission to students and rote-learning are not enough. Students need life-long learning skills to cope with problems they face beyond classroom walls, which requires a special kind of education focusing on how to think better (McGuinness, 1999). Acknowledging this, the field of education witnessed a paradigm shift after 1980s from simply knowledge accumulation of discreet skills to inquiry, reflection, reasoning and various thinking skills (Facione, 1990a) such as analytical thinking, creative thinking, critical thinking, reflective thinking, problem solving and decision-making skills (Aybek, 2007; Dilekli, 2019; Şahin & Tunca, 2013; Yılmaz, 2019). These skills are also called as higher-order thinking skills with the last three levels of Bloom's taxonomy; analysis, synthesis and evaluation (Akkuş-Çakır & Senemoğlu, 2016).

Regarding thinking education, there are three main approaches in the literature (Dilekli, 2019; McGuinness, 1999). The first approach is used for general thinking skills or for "learning to think" which aims at teaching thinking skills independent from discipline, for instance Feuerstein's Instrumental Enrichment (Feuerstein & Jensen, 1980). The content of the approach encompasses issues such as national and international policies, problems at schools or environmental problems (Ennis, 1989). However, it is not globally accepted since it decreases the value of knowledge. The second approach grounds on structuring subject-matter instruction to scaffold thinking (e.g. Cognitive Acceleration through Science Education). It is also criticized because it does not allow knowledge transfer among disciplines. The third and widely acclaimed approach is infusing thinking across curriculum, which has been developed as an alternative to knowledge transfer problem. It entails designing course content in a way to teach thinking (e.g. Activating Children's Thinking Skills) and by making thinking one of the fundamental learning outcomes (Dilekli, 2019; McGuinness, 1999). The thinking skills scrutinized in this study are critical thinking (CT) and analytical thinking (AT).

### Critical Thinking

The word "critical" was derived from Greek words "criticos" (judgement, evaluation) and "criterion" (standard) and was borrowed by other languages. Etymologically, "critical" literally means objective evaluation and judgement. Essentially, CT refers to rational and evidence-based evaluation (Paul & Elder, 2020). Although it is difficult to come up with an accepted definition of CT since defining it with memorization is against the nature and spirit of this particular type of thinking (Facione, 2011), there are various definitions in the literature sharing certain similar features. CT can be defined as the perception of truth through reasoning and inquisitive perspective, the competency of differentiating arguments, recognizing biases and logical fallacies, and reflective thinking on what to believe and reject (Aybek, 2007; Ennis, 1989; Facione, 2011; Norich, 2014; Şahin & Tunca, 2013; Yazçayır, 2015; Yılmaz, 2019). CT is an individual disposition and skill used with reflective skepticism in performing any activity and therefore is used in other higher-order thinking skills, as well.

Along with knowing what it means, it is also important to know the skills and dispositions needed for CT (Aybek, 2007). In his seminal article, Facione (1990a) revealed that CT requires the use of both skills and dispositions. The experts participated in his two-year-long study agreed on six core skills needed for CT. Table 1 shows these skills with the revised version of sub-skills (Facione, 2011).

Table 1. *Core Critical Thinking Skills and Sub-skills*

<i>Skill</i>	<i>Sub-skills</i>
Interpretation	categorize, decode significance, clarify meaning
Analysis	examine ideas, identify arguments, identify reasons and claims
Inference	query evidence, conjecture alternatives, draw logically valid or justified conclusion
Evaluation	assess credibility of claims, assess quality of arguments that were made using inductive or deductive reasoning
Explanation	state results, justify procedures, present arguments
Self-regulation	self-monitor, self-correction

Source: Facione, P. A. (2011). Critical thinking: What it is and why it counts. *Insight Assessment*, 2007(1), 1-23.

As Table 1 shows, CT encompasses the skills of interpretation, analysis, inference, evaluation, explanation and self-regulation with their various sub-skills. Facione (2011) also lists the dispositions of a critical thinker as inquisitive, judicious, truth-seeking, confident in reasoning, open-minded, analytical and systematic. In a similar fashion, Cottrell (2017) asserts CT is a complex and considerate thinking process involving a variety of skills and dispositions. CT requires the use of cognitive processes such as attention, classification, selection, and evaluation.

People who make good decisions are the contributors yet not burdens to the society for its future generations and welfare. However, Paul and Elder (2020) hold that many people do not have the necessary thinking skills for a quality life. They assert that CT skills do not develop in a short time-period or with basic activities. People develop as a critical thinker over time and it requires deliberate commitment. Hence, Paul and Elder (2020) list the development of CT skills at six stages; 1- unreflective thinker, 2- challenged thinker, 3- beginning thinker, 4- practicing thinker, 5- advanced thinker, 6- master thinker. The first four of these stages are development stages whereas the fifth and sixth stages are advanced thinkers' stages in which they develop thanks to their applications and prudent thinking is part of their everyday practice. Paul and Elder (2020) claim that most people live as unreflective thinkers throughout their lives, which suggests the idea of teaching these skills at early ages as possible.

As a matter of fact, the word "critical" is an adjective and it modifies thinking, which is another reason why it should be directed to a specific subject-matter (McPeck, 2016). However, due to the lack of a common definition of the concept (critical), it seems to be a fuzzy term in education, too. Many courses or applications on CT vary from Latin, logic, mind games, to solving puzzles and they all claim to enhance CT (McPeck, 2016), but it can be achieved via systematic programs. Some experimental and quasi-experimental research studies on teaching CT showed that these kind of thinking trainings developed students' (De Bono, 1985; Facione, 1990b) and teacher candidates' (Akkuş-Çakır & Senemoğlu, 2016; Aybek, 2007; Cantürk-Günhan & Başer, 2009; Çinici & Ergin, 2019; McGuinness, 1999; Tok & Sevinç, 2010) thinking skills like critical, analytical and creative thinking. The fact that CT can be taught indicates that it can be achieved through exercises or problem-solving activities (McPeck, 2016). Nevertheless, doing exercises or repetition solely is not enough, so these exercises should be tailored to the aims of courses and be linked with course contents.

## **Analytical Thinking**

The second higher-order thinking type covered in this study is AT. The word “analysis” is borrowed from ancient Greek and it means decomposing or breaking up something into its smallest parts. It requires the ability to work with these smallest parts and to recombine them to make one’s decisions. AT is the ability of this systematical structuring of the components of a whole (Behn & Vaupel, 1976). Bloom’s renewed taxonomy defines ‘analyzing’ as breaking-down a material into its components and understanding of how these components are in relation with the whole (Anderson et al., 2014). For instance, decomposing a sentence into its parts of speech such as subject, verb or object, finding out the facts and opinions in a text, analyzing the components of a substance, identifying the best alternative among others in problem-solving are some examples to AT (Yılmaz, 2019).

The roots of AT dates back to the studies of Aristo, in which the foundations of reasoning were examined (Akkuş-Çakır & Senemoğlu, 2016). AT also places an important role in Descartes’ philosophy (Akkuş-Çakır & Senemoğlu, 2016; Özdemir; 2020), which holds that solving a problem requires to separate it into its smallest components through sequencing. Behn and Vaupel (1976) advocate that developing AT skills help people to make logical decisions while solving problems in fairly short time and with limited information and it turns into a habit over time. Hence, AT is typically associated with problem-solving skills since it is used as a method in solving problems (Özdemir, 2020; Weisberg, 2015).

The literature on AT shows that it is composed of certain skills just like CT. Akkuş-Çınar and Senemoğlu (2016) list AT skills as identifying connections between the components of a whole by analyzing a situation, finding out the biasness and assumptions, evaluating and expressing validity and reliability of justifications clearly. Dilekli (2019) holds that AT is composed of five skills. They are comparison, classification, part-whole relation, sequencing, and making cause-effect relation skills. Anderson et al. (2014) on the other hand, assert that learning AT on its own right is important, but it can be considered as the extension of understanding, or the starting point of evaluating and creating levels of cognitive processes. They also add that AT includes differentiating, organizing and appraising skills.

This research study focuses on an elective course called “Critical and Analytical Thinking Course” (CATC) offered at a state university. Overall, the study aims at revealing the opinions of teacher candidates regarding CATC’s content, delivery and activities carried out.

## **CATC**

In the literature, there are two major approaches with regard to teaching CT, which are known as subject-based teaching and skills-based teaching (Aybek, 2007). Subject-based approach is similar to the third approach mentioned above concerning teaching thinking skills and it entails teaching CT by infusing it to the all aspects of curriculum. According to Facione (1990a), teachers should be role models for how to use content to develop CT and make use of every case in order for students to justify their reasons, provide evidence for their arguments and should design collaborative activities in which students are able to freely discuss and express themselves. Content and Language Integrated Learning in English Language Teaching (Uribe-Encisco, Encisco, & Daza, 2017) and The Foundation for Critical Thinking Model (Crenshaw, Hale, & Harper, 2011) based on questioning and Socratic method used in Western Civilization classes are examples to infusing content with CT skills. Whereas in skills-based

teaching, CT is taught through separate courses tailored for it, for instance De Bono's (1985) CORT thinking program. De Bono (1987) asserts that focusing on content diverts attention from thinking instruments used, so it is best to teach thinking skills as a set of tools that could be transferred to different areas. In her experimental study, Aybek (2007) compared the effectiveness of these two approaches. Even though both approaches developed students' CT skills, the skills-based approach was found to be more effective.

AT teaching is usually associated with problem solving activities of ambiguous situations and dilemmas (Behn & Vaupel, 1976; Özdemir, 2020; Robbins, 2011). Behn and Vaupel (1976) developed a university course in which students were expected to solve everyday problems of 'busy decision makers' as part of course requirement. Students analyzed the assigned problems through systematic judgement and guessing methods while solving dilemmas. Students followed a five-step process consisting of *think, decompose, simplify, specify and rethink*. Robbins' (2011) "Fluent Thinking Skills" is another example program designed to develop AT. The course is grounded on a set of questioning activities towards the material to be studied. Students are expected to formulate their own questions and answers before and after reading the text in detail. The final activity focuses on the discrepancy between before and after reading and to resolve the discrepancy. The difficulty of the materials to be examined vary from charts, graphs, statistics, to real world problems as students develop their skills. Akkuş-Çınar and Senemoğlu (2016) revealed that teacher candidates' AT skills developed based on creative drama activities and other extra-curricular social activities.

CATC was first taught in 2019-2020 at the state university where the researcher is employed. Therefore, there was a need for scientific data concerning the views of teacher candidates towards CATC, whether CATC achieved its aims and to what extent the methods, techniques, resources, content and evaluation system were effective. The results of this study could shed light on the future design and implementation of the course. CATC was developed by the researcher in accordance with "Critical and Analytical Thinking" course involved in the programs proposed by Turkish Higher Education Council for education faculties (<https://www.yok.gov.tr/kurumsal/idari-birimler/egitim-ogretim-dairesi/yeni-ogretmen-yetistirme-lisans-programlari>). The content of the "Critical and Analytical Thinking" course in bachelor of education programs is as follows:

Basic Concepts and Definitions; brain as a thinking organ, thinking types and classification of thinking; unintentional thinking and its characteristics; intentional thinking and its characteristics; methods for intentional thinking; critical and analytical thinking; fundamental features and criteria of critical and analytical thinking, stages of critical and analytical thinking; factors preventing critical and analytical thinking; scope of critical and analytical thinking; critical and analytical reading; critical and analytical listening; critical and analytical writing.

CATC was a two-hour-course delivered online for one semester (14 weeks). It aimed at helping teacher candidates become inquisitive, questioner, critical, analytical, creative and reflective thinkers, criticizers, respected to individual differences and different ideas, sensitive to national and international issues and conforming to code of ethics within the scope of the content presented above. The methods mainly utilized in the course are question and answer, discussions, Socratic method, problem-solving activities, reflective writings, collaborative teamwork and designing and applying lesson activities based on CT and AT skills. The course content

covering the issues mentioned in the previous paragraph was prepared by the researcher who was also the instructor of CATC.

The course was conducted through the learning management system of the university. The teacher candidates were supposed to study for the course material (lesson notes, readings, videos, documentaries etc.) provided by the instructor before the lesson and they were required to participate in weekly discussions. In order for discussions not to diverge from the purpose and subject, the lecturer informed the teacher candidates about the netiquette and how to treat in the discussion platform at the beginning of the semester and the teacher candidates shared their opinions accordingly in a mutual love and respect environment. Every week, the teacher candidates regularly expressed their written opinions on the assigned discussion topic, read their colleagues' views and commented on them. The lecturer also read these discussions every week and gave feedback to their posts. Similar to flipped learning model, the teacher candidates were required to do the necessary preparation so that the lesson time was allocated for more meaningful activities to elaborate on content, their questions and comments rather than direct instruction.

The teacher candidates were evaluated by a mid-term and final examination. However, the questions were not simply multiple-choice questions but rather critical and reflective analysis of the open-ended questions within the scope of course content. Besides, the weekly discussions were also included into the evaluation system and constituted 20% of the mid-term and final examinations. In the second half of the semester (after mid-term exam), the teacher candidates were asked to prepare their own CT and AT skills activities based on the model activities presented and demonstrated by the researcher (for similar activities, see Dilekli 2019; Özdemir, 2020, and/or visit <https://www.oecd.org/pisa/test/>). Prior to application, the teacher candidates were asked to review the curricula of their programs on the website of Ministry of Education and to prepare a lesson activity that they would associate with thinking skills. These activities were presented in the lessons in a way similar to micro-teaching. The teacher candidates who presented their activities got feedback and they were criticized by their colleagues since giving and taking criticism and how to respond to it were among the major subjects of the course. Upon revisions of the activities based on the feedback obtained, the teacher candidates reloaded them to the system and they were evaluated as part of the final exam. These activities were also shared with all teacher candidates taking the course and they had a valuable opportunity which enabled them to have wide repertoire of activities they could use in teaching certain subjects in their own disciplines when they start teaching. This application also gave them a chance to see how various topics can be handled and taught by different people with different points of views and dispositions.

As it is mentioned above, CT can be taught through content or skills-based. CATC was designed adopting an eclectic approach of the two CT approaches. It is skills-based because CT skills such as checking the credibility of data and justification of an argument or AT skills like comparison and identifying the part-whole relation were taught explicitly. However, the teacher candidates designed and applied their own activities in their own disciplines associating them with particular subjects, which made CATC also content-based.

In order for students to develop their CT and AT skills, primarily teachers and teacher candidates should be equipped with these skills and be able to plan and arrange their teaching practices accordingly (Aybek, 2007; Dutoğlu & Tuncel, 2008; Ekinçi & Aybek, 2010). In CATC,

teacher candidates were taught theoretical knowledge about thinking, thinking types, brain and its structure and nature as a thinking organ, criticism, how to give criticism and the importance of being open to it as part of critical and reflective thinker and teacher, intellectual identity and features, Socratic thinking, critical reading and writing along with practical studies on how to teach CT and AT skills to students and they were also asked to develop their own CT and AT activities.

International examinations like PISA (Program for International Student Assessment) and TIMSS (Trends in International Mathematics and Science Study) measure students' literacy level in various disciplines (<http://pisa.meb.gov.tr/>). Literacy concept entails using the knowledge gained at a certain discipline in solving everyday problems in a way to support social change and development (Yılmaz, 2019). So, these examinations are good examples to review students' academic situations since they place great emphasis on AT (Özdemir, 2020). These examinations test students' creativity, reasoning, CT and AT skills and students are evaluated out of these skills, but 2018 PISA results indicate that Turkish students have poor higher-order thinking skills (<http://pisa.meb.gov.tr/>), which suggests that they need courses or trainings tailored for these skills. CT is a foundational thinking skill enabling a nation to lead more quality life, to make innovative and creative approaches real, thereby, allowing future generations to live in better conditions (Akyel, 2018; Paul & Elder, 2020). Hence, teaching teacher candidates these skills and designing and evaluating courses like CATC are important.

CATC also aims at helping teacher candidates to be able to prepare activities supporting their prospective students to become not only knowers but also thinkers, questioners, criticizers and the ones who are able to apply what they know through activities conducted throughout the semester. In other words, teacher candidates are supposed to train their own students to use thinking skills at analysis, synthesis and evaluation levels. This would be a milestone to solve rote-learning, which is one of the biggest problems of Turkish education system, eventually enabling students to interpret and apply what they know (Işık, 2015) and will inevitably pave the way not only for individual but also social and economic development. However, to be informed of whether CATC is a course that had such an impact on teacher candidates, it should be examined, which was the driving force to conduct this research study.

This study aims at interpreting teacher candidates' opinions concerning CATC carried out online due to Covid-19 pandemic situations in 2020-2021 spring term at an education faculty of a state university located in central Anatolian region. Along with this broad objective, the other questions posed for this study are as follows:

- 1- What are the overall opinions of teacher candidates concerning the impact of CATC on their thinking skills?
- 2- What are the opinions of teacher candidates concerning whether the activities they conducted on critical and analytical thinking skills were beneficial or not?
- 3- What are the strong and weak aspects of CATC based on the opinions of the teacher candidates?
- 4- What should be the characteristics of a CATC to be implemented at education faculties?

## Method

This study grounds on analytical study. Research studies which cannot be classified as qualitative or quantitative are defined as analytical studies (McMillan, 2004). Analytical studies are a kind of research method in which documents, papers, records and other media are examined through cases, opinions, concepts and work of art (Ersoy, 2015). Analytical studies involve qualitative and quantitative research features and are classified as historical analysis, judicial analysis, conceptual analysis and mixed-method research studies (McMillan, 2004). This research study also deployed both quantitative and qualitative data but differs from mixed-method research since mixed-method research holds five major objectives which are triangulation, complementarity, initiation, development and expansion (Greene, Caracelli, & Graham, 1989), some of which are beyond the scope of this study since its primary focus was revealing teacher candidates' opinions regarding the course they took. In order to conduct this study, the researcher obtained Ethics Committee Approval dated 07.06.2021, numbered 69559.

### Participants

At the beginning of 2020-2021 spring term, 176 teacher candidates enrolled at CATC from five different departments. Convenient sampling was employed in the study, which is based on collecting data until reaching the sampling size needed from the participants available (Patton, 2014). The Critical and Analytical Thinking Survey (CATS) and Critical and Analytical Thinking Written Interview Form (CATWIF) developed by the researcher were sent to all teacher candidates enrolled at CATS along with the consent form via the internet as surveys can be applied in various ways (Erkuş, 2021). 78 teacher candidates who volunteered to participate in the study responded to CATS. 62 of the participants were sophomore, 19 were junior and 4 were senior teacher candidates. The departments and numbers of the participants responding to CATS are presented in Table 2.

Table 2. *The Departments and Numbers of the Participants Responding to CATS*

<i>Department</i>	<i>n</i>
German Language Teaching	1
Computer and Instructional Technology Education (CITE)	4
Primary School Mathematics Teaching	42
Preschool Teaching	17
Primary School Teaching	14
Total	78

As shown in Table 2, the participants of the study consisted of the teacher candidates from five different departments. Most of the participants (n:42) were from Primary School Mathematics Teaching since CATC was opened as two classrooms in this department and they were the most crowded groups. The reason why there were very few participants from German Teaching and CITE was the fact that teacher candidates from these departments took the course as additional placement. CATWIF was responded by eight teacher candidates and sent back to the researcher. The departments of the participants responding to CATWIF are presented in Table 3.

Table 3. *The Departments of the Participants Responding to CATWIF*

<i>Interviewee</i>	<i>Department</i>
1	Primary School Mathematics Teaching
2	Primary School Teaching
3	Primary School Teaching
4	Primary School Mathematics Teaching
5	Preschool Teaching
6	Primary School Mathematics Teaching
7	Preschool Teaching
8	Primary School Mathematics Teaching

### **Data Collection Tools, Data Collection Process and Analysis**

CATS, which was the first data collection tool of the study, consisted of three parts. The first part included the consent form and the second part asked demographic questions. In the third part, there were 30 survey items as five-point Likert type (1- strongly disagree; 5- strongly agree) regarding CATC and its implementation. There was also an open-ended item at the end of the survey to further elaborate the participants' views. The writing process of the survey items was conducted as follows: Firstly, the basic headings to be evaluated by the participants were determined. These are the opinions of teacher candidates towards course content, materials and weekly discussions, the skills they gained from the course and the opinions of teacher candidates towards practical activities they conducted. Secondly, the survey items were written according to the applications carried out and the subjects covered within the course over a semester. After the writing process of the survey items, they were sent to the three experts in the field of educational sciences for their evaluation to check whether these items were appropriate in terms of content, objective and clarity. Upon the review of the experts, the necessary revisions were made on the items and they were sent to the participants at the end of the semester via internet just after they were graded so that their opinions were not to be biased since the researcher was also the instructor of the course. The second data collection tool was CATWIF and it consisted of eight semi-structured interview questions. The survey items and written interview questions were prepared congruent with the course objectives, content and activities and piloted before they were applied.

The qualitative survey items were analyzed via descriptive statistics. The open-ended item at the end of CATC and the written interviews were analyzed based on thematic analysis. By allowing researchers to interpret the rich and detailed data, thematic analysis as a research tool is used for identifying, analyzing, and reporting themes within the data (Braun & Clarke, 2006). In light with qualitative research, the researcher adopted an approach holding a six-step-process that Braun and Clarke (2006) propose to conduct a rigorous and sound thematic analysis. Table 4 below shows the phases followed and the procedures conducted within the context of the study:

Table 4: *Phases of Thematic Analysis*

<i>Phase</i>	<i>Description of the process</i>
1. Familiarizing yourself with data:	The recursive reading of the data set comprising of survey responses and written interviews to identify what they convey and to seek for possible patterns for a wholistic interpretation.
2. Generating initial codes:	Coding to immerse into content.
3. Searching for themes:	Sorting out the potential themes.
4. Reviewing themes:	Reviewing the themes for the cohesion both for within and across themes.
5. Defining and naming themes:	Fine-tuning of the themes and by defining and giving them names in light with data set.
6. Producing the report:	Write-up of the analysis by presenting vivid examples and extracts of each emerging theme from the data set.

Although data analysis is not a mechanical and linear process (Braun & Clarke, 2006; Glesne, 2016) in which the researcher needs to cycle back and forth, it is also a simultaneous process involving iterative phases (Creswell, 2014). The six-step-process presented above was followed to ensure a theoretically and methodologically meticulous analysis. In the first phase, because the interviews were in the written form, they were already transcribed by nature. According to Bird (2005), transcription is the essence of the interpretation of the data to be analyzed in qualitative methodology, so the initial phase was the recursive reading of the data set to immerse into it to become familiar with the content. Next, the researcher proceeded with the second phase to generate initial codes. Then in the third phase, the codes were collated and they were listed under potential themes. The fourth phase involved reviewing process of the themes. The researcher reviewed whether all the extracted codes formed a coherent theme and checked the "validity of the individual themes" so that they were in line with the data set and formed a thematic map (Braun & Clarke, 2006). After getting the clear picture of the data set, the researcher defined and named the themes to convey what they actually meant. This process was ended when the researcher was able to describe the content of each theme with several sentences, which is a test Braun and Clarke advocate to check whether themes can be defined clearly. After determining all the themes, the final phase in the thematic analysis was the writing procedure of the report.

For the validity and rigor of the analysis report, the researcher followed the guidelines proposed by Braun and Clarke (2006). First of all, there are sufficient extracts with picturesque examples from the data set to show the "prevalence" of each theme. Hence the latent or semantic meanings and interpretations can be demonstrated to reader. What is more, the extracts are the correct example of the issues discussed. Besides, the researcher paid attention to go beyond surface level of analysis and demonstrated and argued on the underlying reasons, experiences, feelings or cases related to particular themes.

In qualitative studies, the rigor of the study is sustained through peer review, triangulation, negative case studies analysis, audit trail and computer software to ensure trustworthiness (Johnson, Adkins, & Chauvin, 2020). This study also deployed a peer review process to cross-check and critique the codes and themes and presented the negative comments and extracts of the participants in the report writing. Furthermore, the themes obtained from multiple data collection tools enhance the credibility and conformability, which is the case in this study

because the data were collected through quantitative survey responds, open-ended question in the survey and written interview forms for further conformation or refutation.

## Results

The research findings were obtained from CATS and CATWIF and therefore, they were examined in two categories as data from CATS and CATWIF and presented in the order of research questions.

### The Findings Obtained from the CATS

71 out of 78 (%90) teacher candidates responding to CATS were regular students who attended the online courses throughout the semester, which makes the research findings more valuable for the researcher. Under the following headings, CATS items related with each other are presented.

### The Overall Opinions of Teacher Candidates towards CATC

Certain items in CATS were to find out the overall opinion of teacher candidates (research question 1) who took CATC. The overall opinions of the teacher candidates are presented in Table 5.

Table 5. *The Overall Opinions of Teacher Candidates Towards CATC.*

<i>Survey Items</i>	<i>%</i>
I think this course has met my expectations at the beginning of the semester.	98.7
I like the way the course has been taught in general.	97.5
I will recommend this course to my other colleagues.	98.7
I think this is a must-take course by teacher candidates.	100
I think this must be an obligatory course in all departments.	94.9

As shown in Table 5, 98.7% (n:77) of the teacher candidates believed that their expectations from the CATC were met. This finding indicated that the information written in the course description and the briefing by the researcher (lecturer) at beginning of the semester given to the teacher candidates matched with the activities carried out and materials and content presented throughout the semester. So, the pre-semester expectations of the teacher candidates from the course were met by the end of the semester. The responses of the teacher candidates to the open-ended item "*Please write anything that you want to add*" in the CATS also supported this finding:

*This course is a great opportunity to provide someone with different point of views and thinking types that no other people can do...I am so happy that I took this course. (Participant 3)*

*It was the most valuable course of the semester for me. (Participant 19)*

*I am so pleased that I took the CATC. It was more helpful and improving than I had expected. To me, the course was delivered in the best way that it could be through distance education. (Participant 70)*

Another survey item on the general opinions of the teacher candidates was about the delivery of the CATC. 97.5% (n:76) of the teacher candidates stated that they liked the way the

course was taught. Only two of the 78 teacher candidates did remain undecided. This finding also supported the finding mentioned in the previous paragraph stating that the expectations of the teacher candidates were met. Besides, the teacher candidates responded to the survey item "I will recommend this course to my colleagues" positively (98.7%; n:77) and only one teacher candidate did remain undecided. These findings revealed that the teacher candidates were satisfied with CATC and their expectations from the course were met on the whole. The responses given to the open-ended item in the CATS also supported these findings:

*This was one or two of the courses I have enthusiastically attended throughout the semester. (Participant 50)*

*Your course was the only course I looked forward to attend. I would definitely take this course again if I was given another chance. (Participant 71)*

The teacher candidates were asked questions whether this elective course (CATC) was necessary for them at education faculty and whether it should be an elective or required course. As seen in Table 5, all teacher candidates (100%; n:100) believed that the CATC had to be taken by all teacher candidates. 94.9% (n:74) of the teacher candidates believed that the CATC needs to be a required course in all departments of education faculties. While two teacher candidates disagreed with this idea, two teacher candidates remained undecided. The responses of teacher candidates to the open-ended survey item were also in line with this finding:

*I believe this course is of great importance and is very influential for prospective teachers. (Participant 21)*

*It was a very productive course. I definitely think that it must be taken by all teachers. (Participant 22)*

*I fortunately took this course. I think all teacher candidates should take this course. (Participant 43)*

*I am in the opinion that all teacher candidates at education faculties should take this course...everybody should gain these thinking skills. (Participant 74)*

### **The Opinions of Teacher Candidates towards Course Content, Materials and Weekly Discussions**

CATS included items concerning how teacher candidates evaluated the course content, materials (lesson presentations, documents, resources, videos, podcasts etc.) provided to them and what they thought about the weekly discussions conducted online. The opinions of teacher candidates are presented in Table 6.

Table 6. *The Opinions of Teacher Candidates towards Course Content, Materials and Weekly Discussions*

<i>Survey Items</i>	<i>%</i>
I think the course content is rich and sufficient.	89.7
I think the course content and the subjects covered have contributed to my professional development.	100
I think the course content and the subjects covered have enriched my world knowledge.	97.4
I think the materials presented in the course have been sufficient.	91
I think the written and visual materials have been intriguing.	93.6
I think the weekly discussions conducted throughout the semester have been beneficial.	94.9
I think the weekly discussions have developed my written expression skills.	92.3

As shown in Table 6, the teacher candidates (%89.7; n:68) thought that the course content provided to them were rich and sufficient. Only 10 of the 78 teacher candidates remained undecided about this and none of them expressed negative opinions. All teacher candidates (100%; n:78) believed that CATC supported and contributed to their professional development. The teacher candidates believed that the course content and the subjects covered enriched their world knowledge (97.4%; n:76), the materials provided to them were sufficient (91%; n:71) and these materials were intriguing (93.6%; n:73). The written responses of the teacher candidates to the CATC also supported these findings:

*I believe this course has been influential in our both professional and everyday lives. Many thanks to our teacher. (Participant 27)*

*...It's been one of the most entertaining and beneficial courses for me because the content consisted of the subjects I find intriguing and you delivered the course in an entertaining fashion with the help of the resources and the videos you prepared before the lessons (Participant 71)*

In CATC, the students were required to participate in weekly discussions on the subject studied, expressed their written opinions and exchanged ideas on the online platform. The lecturer read the discussions and gave feedback to teacher candidates' posts. This application was found to be quite beneficial by the teacher candidates (%94.9; n:74). While two teacher candidates remained undecided, two teacher candidates thought that these discussions were not beneficial. Besides, the teacher candidates believed that they developed their written expression skills through this application (%92.3; n:72). The written feedbacks of the teacher candidates supported this finding:

*The course was conducted quite well from beginning to the end and we had continuous in-class discussions and exchanged views. It has been very influential on us. (Participant 55)*

*Weekly discussions were so beneficial even though I didn't attend all of them. But, I enjoyed a lot the ones I attended because in my opinion, the discussions topics were appropriate and meaningful. (Participant 70)*

### **The Skills Teacher Candidates Gained from CATC**

As part of research question 1, some items in CATC were concerning the skills that were gained by teacher candidates through the course. The teacher candidates stated that they gained certain skills thanks to this course and they added that they would apply these skills in both professional and everyday lives. The achievements teacher candidates thought they earned from the course are presented in Table 7.

Table 7. *The Achievements of Teacher Candidates from CATC*

<i>Achievement</i>	<i>%</i>
I think the course has developed my critical thinking skill.	%100
I think the course has developed my analytical thinking skill.	%98.7
I think the course has developed my critical reading skill.	%94.9
I think the course has developed my critical writing skill.	%88.5
I think the course has developed my reflective thinking skill.	%91.1
I think the course has developed my creative thinking skill.	%84.6
I think the course has helped me to know myself better as an individual.	%94.9
I think this course have contributed to the comprehension of democratic values better.	%94.8

*Table 7 (Cont.)*

I think the course have enabled me to recognize the propaganda / hidden messages in written and visual media.	%84.6
I think the course have helped me understand how to criticize better.	%100
I think I have grasped what to do to establish a criticism culture in my future classes thanks to this course.	%100

The teacher candidates did not respond to any items listed in Table 7 as undecided or negatively. All of 78 teacher candidates (100%) thought that they developed their CT skills, learned how to criticize and what to do to establish a criticism culture in classrooms thanks to this course. Their responses to the open-ended survey item also supported their views because one of the primary subjects they focused in their responses was criticism and criticism culture. Some quotations regarding this topic are shown below:

*Actually, one of the conclusions we draw from this course is that criticism is always deemed as negative criticism in our society and most importantly, we have learned the beauties that positive criticism can contribute to our lives by breaking the prejudices. (Participant 28)*

*I found opportunities to question and know myself thanks to this course. I think I have learned self-criticizing. I have developed awareness in my life. (Participant 31)*

*I have started to look at myself and around in critical approach thanks to this course. (Participant 71)*

As can be seen in Table 7, the teacher candidates also believed that they gained knowledge and developed skills towards AT (98.7%; n:77), critical reading (94.9%; n:74), reflective thinking (91.1; n:71), creative thinking (84.6%; n:66), recognizing the propaganda in media (84.6%; n:66), knowing oneself better (94.9%; n:74) and understanding democratic values (94.8%; n:74).

### **The Opinions of Teacher Candidates towards Practical Activities on CT and AT Skills**

As for the second research question, some items in CATS were to determine the opinions of the teacher candidates regarding practical applications. In CATS, the teacher candidates worked on concrete examples concerning CT and AT skills in their prospective classrooms in the second half of the semester. Two weeks of the semester were allocated for in-class teaching activities and presentations they prepared in order to teach CT and AT skills associating them with the learning outcomes they selected in their own disciplines. Similar to micro-teaching, the teacher candidates made online presentations (lesson activities) at certain weeks and received feedback from their colleagues and the lecturer. Then they revised their activities and submitted them to the lecturer. Table 8 shows teacher candidates' opinions concerning these practical applications.

*Table 8. Teacher Candidates' Opinions on Practical Activities.*

<i>Survey Items</i>	<i>%</i>
I think in-class practical activities we carried out to teach critical and analytical thinking skills are beneficial for our professional development.	100
I know how to gain critical and analytical thinking skills to students in my own discipline thanks to this course.	94.9
I believe teaching critical and analytical thinking skills in my own discipline is easy.	62.8

Table 8 shows that all teacher candidates believed that in-class practical activities carried out in CATC were highly beneficial for their professional development (100%; n:78). The teacher candidates' written responses also supported this finding:

*The focus on self-evaluation in the activities conducted in the CATC enabled us to know ourselves, recognized our requirements and helped us to develop. (Participant 25)*

*We were given opportunity for application in the course and this was the greatest part. ...Our presentations in the lessons made the course (content) more permanent and I believe they contributed a lot to our professional lives. (Participant 70)*

*...the activities we designed and our methods we used in the preparation phases will inspire me when I start teaching. (Participant 71)*

Regarding practical activities, one of the CATS items the teacher candidates were asked was whether they knew how to teach CT and AT skills to students by the end of the course. This survey item was responded positively by 94.9% (74) of the teacher candidates. While three teacher candidates remained undecided, one teacher candidate disagreed. Even though the teacher candidates stated that they knew how to teach CT and AT skills to students, they believed it was not easy to do so in the classroom. The fact that more than half of the teacher candidates responded positively (62.8%; n:49) to this item, this rate was not as high as the rate of other positive responses. This was the lowest positive survey item of all because 27 teacher candidates remained undecided and two teacher candidates disagreed with this item. In other words, teacher candidates thought that teaching CT and AT skills was relatively easy, but they did not express it strongly.

### The Findings Obtained from the Qualitative Data Analysis

The qualitative data (written interviews and open-ended survey question) were analyzed for two purposes. Firstly, they were examined for further elaboration of the first and second research questions and to answer the third and fourth research questions; "what are the strong and weak aspects of CATC and what are the characteristics of a CATC to be implemented at education faculties?" respectively. The thematic analysis of the written interviews conducted with eight volunteered teacher candidates revealed five themes. Figure 1 shows these themes.

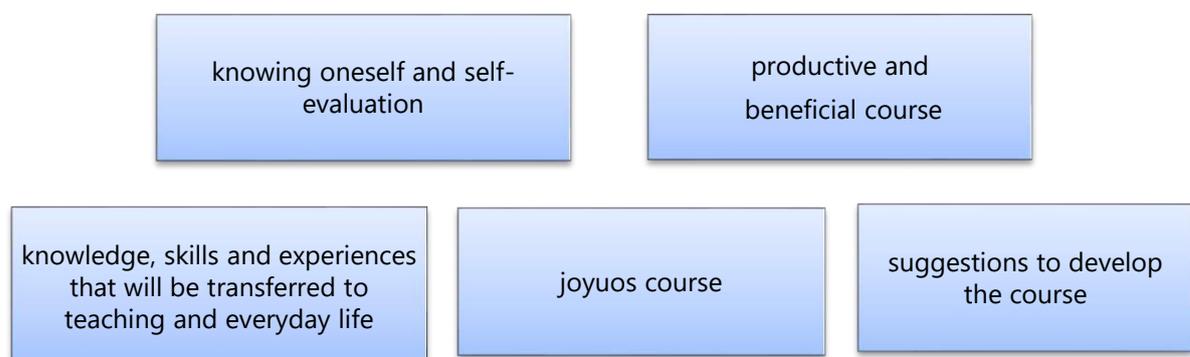


Figure 1. Themes Emerged as a Result of Written Interviews

As seen in Figure 1; the themes emerged from the interviews were “knowing oneself and self-evaluation”, “productive and beneficial course”, “knowledge, skills and experiences that will be transferred to teaching and everyday life”, “joyous course”, and “suggestions to develop the course”. These themes are further explicated below through direct quotations showing teacher candidates’ views.

### **Knowing Oneself and Self-Evaluation**

The first theme was “knowing oneself and self-evaluation”. This theme also supported the responses of the teacher candidates to the CATS item “I think the course has helped me to know myself better as an individual” (94.9%). The teacher candidates thought that CATC provided them with some intellectual opportunities that they might not find in any other courses. By means of this course, the teacher candidates thought that they commenced to recognize and make sense of their own mindset, point of views, and the factors influencing on them. The teacher candidates stated that they began to think on these kinds of issues in-depth and began to self-evaluate and self-critique themselves. This mental transformation of teacher candidates was the indicator of the intellectual development, as well. The quotations presented below show how teacher candidates knew and understood themselves better:

*I initially found self-exploration opportunities in this course. I understood my CT level in which I am by evaluating myself. I found opportunities for self-evaluation. (Interviewee 1)*

*The course enabled me to learn about the perspectives I always wanted to look through...It's a very beneficial course to develop oneself and to recognize different points of views. (Interviewee 2)*

*The course content and the subjects covered in lessons were helpful to think from different perspectives. (Interviewee 3)*

*The key that this course gave to me to explore myself, my life, and the human environment was “thinking”. I realized that I hadn't thought until I took this course, like a cold and strong wind hit my face. I had accepted everything I was told as truth. (Interviewee 7)*

Apart from the findings obtained from the written interviews, a great proportion of the responses of teacher candidates to the open-ended survey item showed and supported the mental transformation they went through and the new perspectives they gained. The following quotations show teacher candidates’ views on this mental transformation:

*This course enables us to overview the ideas we have and hence we cross the limits of thought. At the same time, it is a course leading us to ask questions like “Who am I in this system that we cannot figure out in collectivism? Are all the thoughts and traditions approved by society valid and true?” (Participant 3)*

*I can say that CATC took me from one place and replaced to a totally different place. (Participant 47)*

*I gained a lot of awareness for my future career that I couldn't think of before and this is so precious. (Participant 50)*

Regarding knowing oneself and self-evaluation theme, the last finding resulted from the written interviews was about at what stage of CT development processes (Paul & Elder, 2020) that teacher candidates believed they were. So, one of the questions the teacher candidates were asked was “At what stage of CT do you evaluate yourself?” 1- unreflective thinker, 2- challenged thinker, 3- beginning thinker, 4- practicing thinker, 5- advanced thinker, 6- master

thinker (Paul & Elder, 2020). Seven of eight teacher candidates evaluated themselves as “practicing thinker”, and one teacher candidate evaluated herself as “beginning teacher” by the end of the course and semester. The fact that the teacher candidates deemed themselves at the “practicing thinker”, which is the last stage of CT development, suggested that the teacher candidates developed at CT and reached the last stage before “advanced thinker” and “master thinker”.

### **A Productive and Beneficial Course**

The teacher candidates who took the CATC stated that this course both developed their professional and world knowledge and skills, at the same time it became influential on the decisions they took in their everyday lives. The quotations below show that the CATC was a productive and beneficial course for the teacher candidates:

*The course has been quite effective and productive. (Interviewee 1)*

*It's a very beneficial course for self-development and to recognize different point of views. (Interviewee 2)*

*Even though it was delivered on-line, I wondered how it would be if it had been delivered face-to-face in classroom... I can say that the course made the best of what its name suggests. (Interviewee 3)*

*I think CATC is a very important and necessary course for teacher candidates. It was a highly beneficial experience. (Interviewee 4)*

*...I wish I could be able to take it again in summer school because I can enhance the knowledge I have gained in one semester in a longer period. (Interviewee 7)*

*...I think this course must be taken not only by my colleagues but also everyone who takes education. (Interviewee 8)*

As the quotations above show, the teacher candidates believed that CATC was a very beneficial course on their thinking skills. This view of teacher candidates was also supported by the findings obtained from CATS. The results of CATS revealed that CATC contributed to the teacher candidates at various fields ranging from CT and AT, creative thinking, reflective thinking, criticizing to internalizing democratic values. What is more, three teacher candidates asserted that CATC was a course that could contribute to social change and development. These teacher candidates believed that by equipping students with these skills, they would support to train generations who could think better and take more effective decisions, and hence, they could support social development. The following quotations reflect this view:

*I believe that every individual should take this course... With gaining the skills required by the era, social development of our country will be supported and this will bring prosperity to our people. This prosperity will give pave for a future in which they can work comfortably. (Interviewee 5)*

*To take this course for us as teachers is of great importance in a time in which the knowledge changes rapidly and there is a lot of false and manipulated information. (Interviewee 7)*

*Advancement of a country by making thinking effective will also bring social peace and happiness and therefore, I think everybody should take this course. (Interviewee 8)*

While explaining the contributions of CATC to herself, participant 7 shared a dialog she had with one of her colleagues who was a teacher candidate taking a course with the same name. Participant 7 expressed her views as “...as my friend says, CATC is not selected as it is deemed

as waste of time. She immediately asked for the course notes as soon as I explained our course content and what we learned". According to this anecdote, CATC was accepted as unnecessary and unimportant in that university. However, the acquisitions of participant 7 and her sharing them with a colleague from a different university suggested the extent the lesson was found to be beneficial and at the same time, how it affected a teacher candidate who did not take this course. Besides, as the findings obtained from CATS indicated, the teacher candidates believed that CATC was a necessary course and it must be taken by all teacher candidates at all departments.

### **The Knowledge, Skills and Experiences to be Transferred to Teaching Profession and Everyday Life**

The teacher candidates thought that along with overall contribution of CATC, it also equipped them with the practical knowledge and skills they would apply in their future career. This view of teacher candidates had two dimensions. The first was related to how to teach CT and AT skills in lessons, and explaining this with concrete application examples. The teacher candidates stated that they learned how to teach CT and AT with other higher-order thinking skills by associating them with course subjects and learning outcomes in their own disciplines. They also added that they were going to apply these skills in their classrooms. The following quotations below show teacher candidates' views regarding these two dimensions:

*I will closely examine and transfer the skills we covered in our presentations into my lessons. (Interviewee 2)*

*...I aim at making my students use CT and AT skills in a collaborative learning environment in the activities I will prepare. (Interviewee 3)*

*We learned how to carry out activities including CT and AT and we designed our own activities. I'm planning to use these activities in my teaching life. (Interviewee 4)*

*With the help of the example activities we were provided in the lesson, I will conduct activities that will contribute to cognitive, social and affective development of my students through thinking and reasoning. (Interviewee 5)*

*I'd like to apply the example activities we carried out in lessons (the activities that we prepared for CT and AT) directly in my professional life. Not only did your instruction I consider important, but also preparing activities in line with our own discussion and instruction. (Interviewee 6)*

*I learned about the activities, games, exercises etc., and I quickly adopted them in my life. (Interviewee 7)*

*...I'd like to practice CT and AT inspiring from the activities we conducted at the end of the semester. Especially, practicing about the importance of thinking skill will be a wise approach both for me and for my students. (Interviewee 8)*

The quotations above suggest that the CT and AT activities the lecturer provided to the teacher candidates and the activities the teacher candidates prepared supported their professional development. The teacher candidates stated that they adapted these applications carried out in lessons and they would apply them in their classrooms in their future careers. The teacher candidates' views regarding these practical applications also supported the findings obtained from CATS. All of the teacher candidates (100%) responding to CATS thought that in-class practical applications and example activities carried out in lessons contributed to

their professional development. Similarly, all teacher candidates interviewed expressed views concerning these practical applications.

Another subject that the teacher candidates would transfer and apply into their professional and everyday lives is to establish the culture of criticism and train self-confident students. The views of teacher candidates regarding this topic are presented below:

*I think that the culture of criticism should definitely be infused into students. Students should listen to others' opinions and respect them. For this reason, I'd like to create discussion platforms in which my students will be able to express themselves freely and listen to each other with due regard. (Interviewee 1)*

*Being respectful to opinions, teaching criticism is not something negative, treating kind and concerned, creating various learning fields will pave the way for the changes in education system. At least in my own way, I believe the students I will train will take this as a model and this butterfly effect will go on. (Interviewee 3)*

*In order to infuse the criticism culture into students, I will educate them in a way that will allow them to express themselves freely and respect each other's differences. (Interviewee 5)*

*A critical classroom setting. A classroom setting in which everybody can comfortably share their ideas with due regard and others think over these ideas without insulting and humiliating anyone. I hope I will succeed. (Interviewee 7)*

*... In terms of taking a country to an advanced and civilized level, I believe this course holds a very important duty. (Interviewee 8)*

The quotations above show that the teacher candidates developed skills or awareness in expressing themselves with self-confidence critically in a democratic environment and tolerating criticism which can be accepted as the prerequisites of critical thinking. The teacher candidates would like to apply what they learned from CATC in their classrooms in order to establish criticism culture and democratic values in society. This sub-theme also supported the findings obtained from CATS. The teacher candidates responding CATS thought that among the acquisitions from CATC were how to do criticism (100%) and what to do to establish criticism culture and to understand democratic values better (94.8%).

### **A Joyous Course**

Another theme emerged from the analysis of the interviews was that CATC was deemed as "a joyous course". Apart from supporting their individual and professional development and being a necessary course, the teacher candidates stated that attending the course and the delivery of it by the lecturer were joyful and they spent entertaining time in lessons. The following quotations below show their opinions regarding this particular theme:

*It was very joyous. The course was highly joyous. (Participant 2)*

*I can say that the course that gave me the most pleasure has been CATC since I started university. (Interviewee 3)*

*It was so entertaining for me that I never got bored in the lessons. The fact that it was a thought-provoking course was the reason that made me love the "Course" more. (Interviewee 4)*

*...It can be said that the course is motivating and intriguing since it is associated with real life and past experiences. I am content with the course while taking online, but in face-to-face education I*

*believe it might be more productive with the active participation of students. Nevertheless, it is overall a necessary, instructive and joyous course. (Interviewee 5)*

*It was the course that I liked most among others in this semester... its delivery and instruction were fluent and fun. (Interviewee 6)*

*As I always said, I really liked this course a lot. (Interviewee 7)*

The responses of the teacher candidates to the open-ended survey item also supported the views of the participants interviewed. A significant amount of the responses to the open-ended survey item was related to the joyous nature of the course. The following quotations taken from CATS below reflect the views of teacher candidates that they enjoyed the lesson:

*I liked the course a lot. Luckily, I took it. (Participant 47)*

*Beside my personal development on CT and AT, I absolutely enjoyed listening to and attending the course. (Participant 50)*

*It was one of the very few courses that I was biased against, but I was sorry that it ended at the end of the semester. (Participant 21)*

*...It's been one of the most entertaining and beneficial courses for me... (Participant 71)*

### **Suggestions to Develop the Course**

The final theme emerged from the analysis of the written interviews carried out with the teacher candidates were concerning "suggestions to develop the course" as part of the last research question exploring the characteristics of a CATC to be implemented at education faculties. The teacher candidates were asked questions regarding the issues that they did not like and that needed to be developed or changed related to CATC. As stated earlier, although the teacher candidates liked the content, delivery and the materials on the whole, they also made some suggestions to develop the course. The teacher candidates' suggestions fell under three headings. The first was "the criticism (review) of a movie or book/novel"; the second was "extending the practical applications to a longer period"; and the third was "participation in the course and interaction".

The teacher candidates were provided with some videos, documentaries or podcasts related to course subject and they were asked to reflect their views about these materials in the discussion platform. Beside these applications, two teacher candidates proposed to choose certain movies or books that would support higher-order thinking and help them gain critical point of views at the beginning of the semester and to include these movies and books that would be critiqued into the instruction and evaluation system of the course. The teacher candidates thought that the critical reflection of these movies and books as individual or group discussion could be beneficial for their higher-order thinking skills. The views of teacher candidates regarding this topic are presented below:

*As a suggestion, maybe at the beginning of the semester, a book might be selected for everyone. At the end of the semester, students can be asked to discuss about the book as whole class, and also, they were asked to write a critical review. (Interviewee 6)*

*I would occasionally expect to find some movies and novel recommendations apart from the podcasts and videos in the discussion platform. (Interviewee 6)*

*To me, some movie recommendations supporting CT and developing AT with course materials can be presented to students, and novels in the same way. (Interviewee 7)*

*To me, critical movie watching can be added (to the course). One of the box office and thought-provoking movies like Matrix or Fight Club can be selected and an application targeting to gain critical point of view...can be conducted. (Interviewee 7)*

Another suggestion made by the teacher candidates was regarding the practical applications conducted in lessons. As stated in the findings above, the teacher candidates deemed the practical activities on how to teach CT and AT in the classroom quite beneficial for their professional development and proposed to do these activities throughout the semester, namely in a longer period. The teacher candidates carried out the practical activities targeting to develop CT and AT mainly as group-work presentations and online in two weeks specified in the syllabus. Although the teacher candidates liked this application, they thought doing presentations in a different format would be more effective. The views of the teacher candidates regarding this application are presented below:

*It's not disappointment, but I think the only thing I can say it would be better is not to squeeze all the presentations into one single week...In this way, problems like focusing can be minimized. (Interviewee 1)*

*When the pandemic conditions end or we turn back to schools, every week student presentations on a different topic including various skills can be conducted in face-to-face lessons. The presentations made by different student groups every week might make lessons more enjoyable. (Interviewee 3)*

*...Because the lesson time is limited and courses are delivered online, the practical applications conducted can be said to be sufficient. In addition, increasing the number of these practical studies might be better. (Interviewee 8)*

*My only criticism might be this: The time period we conducted our activities seemed to be short. Instead of watching all presentations in one week, I think extending them to at least two weeks might be a better way to be able to watch them productively. (Participant 50)*

The final suggestion of teacher candidates was about "participation in the course and interaction". Acknowledging that participation in the course could not be as high as in face-to-face education since it was delivered online in distance education conditions, they thought active and vocal participation rate of students in the course should have been enhanced in a way. They also wanted to interact more with the lecturer. The teacher candidates' views regarding this topic are as follows:

*I would ask for more time to have conversation with the lecturer. I would like to discuss the results of test that I did individually. One lesson could be devoted for such an application. (Interviewee 2)*

*There must be more student participation... because of the conditions at home, I was unable to participate in the lessons vocally. I participated in the course in written ways, but I think I was unable to express myself exactly. It seems to me that the best way of doing it is to deliver the lesson face-to-face and this is not in your power. (Interviewee 4)*

*...because my colleagues hesitated to participate in the lesson vocally (in distance education), or they were unable to do it, I didn't participate vocally, either. Ideas could have been conveyed easily through more vocal participation. (Interviewee 5)*

One teacher candidate acknowledged that the subjects covered and discussed in the lessons were important and necessary. However, she also thought some current and sensitive social issues that were not discussed in other courses and platforms could have been covered in-

depth because of the nature of CATC. The opinions of the teacher candidate regarding this issue are presented below:

*The issues we discussed in our last lessons were very important. Even if we don't want to see, we have some realities in our country, such as gender discrimination, racism, sexual orientation racism and inequality of opportunity... I believe these issues should be addressed. (Interviewee 4)*

Finally, the teacher candidates were asked questions concerning the evaluation system of CATC. All of the teacher candidates interviewed (100%) deemed the evaluation of the course as a logical and fair system. The following quotations below show the views of teacher candidates concerning the evaluation system of CATC:

*To me, the evaluations carried out were appropriate to assess the learning outcomes...We put our critical and analytical knowledge into practice while engaging with our tasks and activities. It was very effective in my opinion. (Interviewee 1)*

*The method was quite good. Maybe, we might have sometimes given personal examples from our daily lives. (Interviewee 2)*

*... and the evaluation process provided us with permanent learning. (Interviewee 3)*

*Asking for designing CT and AT activities for the evaluation of this course was a wise decision.... If we hadn't designed those activities, I might not have realized that utilizing CT and AT was not that difficult. (Interviewee 4)*

*I approve the evaluation of this course. Both the pandemic conditions and the primary philosophy of the course indicate that the learning outcomes of this course cannot be achieved through an ordinary examination. (Interviewee 5)*

*For the evaluation of the course, we designed activities for the final exam and we answered open-ended questions for the mid-term exam. To me, the final exam was terrific. (Interviewee 6)*

*To me, the method (for evaluation) was quite successful. Everything was prepared meticulously such as the materials, course content and evaluation. (Interviewee 7)*

## **Discussion, Conclusion and Implications**

This research study aimed at revealing the opinions of teacher candidates regarding CATC conducted at a state university. The study showed that the teacher candidates were highly pleased with it. By the end of the semester, the teacher candidates thought that CATC supported their individual and professional development and enabled them to look at the world from different perspectives. Even though it takes time to develop thinking skills, the teacher candidates believed that CATC developed their CT and AT skills after completion of it. In addition, the study yielded similar findings compared to the studies focusing on courses or implementations to develop thinking skills of teacher candidates and showed that these skills can be taught and developed (Akkuş-Çakır & Senemoğlu, 2016; Aybek, 2007; Cantürk-Günhan & Başer, 2009; Tok & Sevinç, 2010). The teacher candidates stated that beside professional and personal acquisitions, CATC was in the first place of the courses that they enjoyed at the time when the study was conducted. The teacher candidates also asserted that this elective course must be a required course to be taken by all teacher candidates at education faculties. This is also similar to what Aybek (2007) had already revealed about education faculty students regarding CT teaching.

The overall findings mentioned above can be deemed as the indicator of the success of the course by achieving its learning outcomes. One of the most significant findings of the course is the view of teacher candidates that CATC can support social development. This finding solely implies that the course fulfills a pivotal mission. The teacher candidates believed that they first and foremost should possess these higher-order thinking skills. By being role models, the teacher candidates held that they could contribute to the education of a generation who would be able to use thinking skills in every field of life and hence could support social development.

The findings also revealed that CT and AT skills of the teacher candidates developed and they learned how to teach these skills by associating them with learning outcomes in their own disciplines. In collaborative group works, the teacher candidates designed lesson activities towards teaching these thinking skills in their disciplines in line with a certain course subject and learning outcomes. They deemed these practical studies rather beneficial for their professional development. This finding also corresponds with the approach holding that thinking skills should be associated with course subjects in a particular discipline and thinking skills should be diffused to whole curriculum (Dilekli, 2019; Ennis, 1989).

In CATC, discussions were carried out with teacher candidates concerning questions asked in international examinations and the logic behind these questions. The teacher candidates explained why Turkish students were unsuccessful in answering questions requiring higher-order thinking skills with specific examples from their own experiences and asserted that rote-learning-based education system did not allow them to put knowledge into practice. The results suggest that the primary reason why the teacher candidates believed CATC supported their both individual and professional development is the nature of the course incorporating theory and practice. The teacher candidates deemed the feedback and comments from their instructor and colleagues valuable for their personal development. The teacher candidates were provided with feedback towards their opinions at weekly discussions and also towards the CT and AT activities they carried out and they did self-reflection and self-evaluation in accordance with these comments and feedback. This kind of a collaborative teacher education in which candidates reflect on their experiences, learn from each other and integrate theory and practice is line with what Korthagen (2005, 2017) calls as "realistic teacher education" based on reflection.

CATC was delivered to teacher candidates online due to Covid-19 pandemic conditions. The infrastructure of the system on which the course was carried out was successful. However, some teacher candidates had technical problems specifically in vocal participation in the lessons, or they sometimes avoided turning their microphones on due to inappropriate home conditions. This led to limited active student participation. CATC by nature was developed based on free discussions and expressing ideas in a democratic environment though. This limitation was attempted to be eliminated through posting written messages reflecting teacher candidates' ideas, yet it slowed down the natural pace of the course and this was expressed by the teacher candidates in the written interviews. The weekly discussions on the other hand helped overcome this limitation and allowed instructor-student and student-student interaction. As it was pointed out in the findings, the teacher candidates were satisfied with this application and they appreciated obtaining weekly feedback and pleased to be informed of the ideas of their colleagues. Every week, the teacher candidates were provided with certain videos, documentaries, discussion programs or other related links to be read and watched till the next

lesson. However, along with these materials, the teacher candidates proposed to integrate books and movies supporting CT by associating with examinations.

Course Proposal: Finally, as a result of the findings obtained from this study, an exemplary CATC, which is very similar to the applied program (except week 1 and week 14) since the teacher candidates were overall satisfied with it, is proposed for future implementations too. However, there are some changes in the evaluation of the course that were not applied in the course implemented because of the reasons explained below. Although the content might alter, a CATC based on fundamental course subjects, applications and evaluations is supposed to enhance individual and professional development of teacher candidates who share similar features at other education faculties. The syllabus of the proposed CATC is presented in Table 9.

Table 9. *The Syllabus of CATC*

Week	Subject
1	<i>Course Description and Introduction</i> <i>The list of movies and books supporting CT</i>
2	<i>What is thinking?</i> The Building Stones of Thinking; Features of Good Thinkers; Factors Hindering Healthy Thinking
3	<i>Brain as a Thinking Organ</i> The Structure of Brain; The Features of Right and Left Brain; Holistic Development of Brain
4	<i>Thinking Types</i> Analytical, Critical, Reflective and Creative Thinking
5	<i>What is Criticism?</i> The Concept of Criticism; Modern, Modernity, Modernism; CT and the Identity of Intellectual; The Fundamental Intellectual Features
6	<i>CT</i> CT Dispositions; The Place of CT in Curriculum; The Attributions Gained Through CT
7	<i>The Activities Regarding to Gain CT Skills</i> Checking the Credibility of Data; Skills for Explaining Reasons; Prediction Skill; Generalizing Skill
8	<i>CT Skills Presentations (Teacher Candidates)</i>
9	<i>CT and Asking Effective Questions</i> Socratic Thinking; In-class Discussion Method
10	<i>AT</i> International Examinations and AT
11	<i>The Activities Regarding to Gain AT Skills</i> Comparison Skill; Classification Skill; Part and Whole Relation; Sequencing Skill
12	<i>AT Skills Presentations (Teacher Candidates)</i>
13	<i>Critical Reading and Writing</i> Analyzing the Text; Academic Reading and Writing
14	<i>Prejudice and Propaganda in Media</i>

As is seen above, CATC complies with the content of the "Critical and Analytical Thinking" course proposed by the Council of Higher Education explained in the introduction under the CATC sub-title. As the subjects in syllabus suggest, teacher candidates are expected to acquire theoretical knowledge base regarding thinking, quality thinking, and higher-order thinking skills within the period until midterm. After midterm, a practical approach based on the use of knowledge is embraced. To this end, the lecturer provides teacher candidates with examples on how to use these skills and guides them. At the same time, the lecturer shares his/her expectations and criteria concerning the practical activities they will prepare and present in the following weeks.

Just as in the applied program, before teacher candidates conduct their activities, they are directed to review the curricula of their programs on the website of Ministry of Education to become aware of the learning outcomes and they prepare a lesson activity related with critical and analytical thinking skills. That teacher candidates prepare lesson activities as individual or group work in the form of micro-teaching and gain teaching experience transforms the activities into a more meaningful and instructive experience for them. CT cannot be reduced to logic or logical thinking. CT definitely includes logic, but it also covers the criterion and pragmatic dimensions (McPeck, 2016). The criterion and pragmatic dimensions have nothing to do with seeking for fallacy and these two dimensions require to be knowledgeable at a certain field. For instance, if a teacher conducts a critical activity on history, then that teacher needs to have history knowledge, too (McPeck, 2016). For this reason, the teacher candidates are supposed to relate CT and AT with their own disciplines. The research findings also revealed that this application was deemed beneficial by the teacher candidates. In addition, the teacher candidates emphasized that this kind of an application was useful for collaborative learning. They enjoyed preparing such activities and they realized how to teach the very same topic from different point of views.

One of the most favorite aspects of CATC was online discussions. It was initially an obligation, but will continue in face-to-face education upon suggestions of teacher candidates and a kind of blended learning model will be implemented. The online discussion platform allowed the teacher candidates to engage in meaningful interaction with the lecturer and other colleagues. In addition, the teacher candidates believed that they advanced their critical writing skills. Discussions helped ensure the comprehension of subjects and they allowed the teacher candidates to express their opinions in a free and comfortable setting of the course. This application also allowed the teacher candidates to enrich the course not only with their opinions but also with the resources they found and uploaded into the system for their colleagues and this made them the contributors of the course and content, as well.

*Evaluation:* The evaluation and examination system of CATC provide various opportunities for the lecturer and teacher candidates because of the properties it presents. Classic examinations will not be appropriate for the purposes of this course. First of all, weekly discussions are an essential part of evaluation. Within this application, the number of participations of teacher candidates in discussions is taken into consideration and this constitutes a certain percent of midterm and final exam. Preferably, the participations of teacher candidates can be added to evaluation based on quality, quantity, or other criteria the lecturer will determine. This could encourage teacher candidates to participate in lesson and express their opinions from a critical point of view.

In CATC, the teacher candidates were asked open-ended questions regarding course subjects in the midterm examination. The components of the final examination were CT and AT activities presented in the lessons and weekly discussions. The teacher candidates obtained feedback concerning their lesson activities from the lecturer and their colleagues and they had another opportunity to revise their activities before submitting to the lecturer for final evaluation. The same procedure will be implemented in the following years depending on the positive views of the teacher candidates participating in the study.

Because the course was conducted online, it prevented to realize some applications that had been planned earlier. During distance education, other courses were delivered online too

and this led other lecturers to implement homework assignments, which increased teacher candidates' workload significantly. In the following implementations of the course though, the primary application in either face-to-face or distance education will be reflective journals and portfolios. Teacher candidates will keep reflective journals from the very beginning of the semester. The structure of journals can vary, but Ruggiero's (2019) suggestion will be implemented in this proposed model. Teacher candidates are supposed to reflect their observations and opinions. Teacher candidates will write their first impressions, opinions and questions in their minds regarding the subject on the left-hand-side of the journal page. After a certain time period (for instance, the time-span till midterm and final examination), they will write their new ideas on the same subject, changed opinions and the answers they have found to the questions they have already asked on the right-hand-side of the journal. Hence, they will have recorded the mental transformation they have experienced from the beginning of the semester till the end.

Another application will be the book or movie review with a critical examination. In this study, the teacher candidates stated that they wanted to carry out such an application. For this reason, teacher candidates will review several books or movies that will be determined at the beginning of the semester and report them by providing justification and evidence in accordance with the criteria to be determined. Finally, teacher candidates will conduct an activity concerning media literacy. To do this, studying the subjects of media literacy and propaganda in media at the beginning of the semester would be more meaningful. The teacher candidates will examine a certain topic (preferably about education) in different media organs and advertisements every week and they will try to identify the elements of manipulation.

It is believed that research results might be of importance in training teacher candidates with intended thinking skills and in future course design. This research study shows that all these applications mentioned above develop thinking skills of teacher candidates. The other applications proposed within this model can be implemented and be enriched through face-to-face, online, blended or flipped learning settings keeping the creativity, dispositions and technical and physical conditions the lecturer possesses. Beside this, other academic studies to be conducted with different teacher candidates at different education faculties and findings to be obtained will contribute to teacher candidates' thinking skills development and provide teacher trainers with new perspectives on teaching critical and analytical thinking. All these studies will eventually pave the way for an education equipping teacher candidates with higher-order thinking skills and this will inevitably contribute to the economic and social development of a particular society with individuals who can deploy these skills in every field of life.

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## **Öğretmen Adaylarının Eleştirel ve Analitik Düşünme Dersine Yönelik Düşünceleri**

### **Giriş**

Eleştirel ve analitik düşünme üst düzey düşünme becerileri arasında yer almaktadır (Akkuş-Çakır & Senemoğlu, 2016). Eleştirel kelimesi eski Yunancada nesnel değerlendirme anlamına gelmektedir (Paul & Elder, 2020) ve esasen mantıklı ve kanıt temelli değerlendirmede bulunmaktadır. Eleştirel düşünce bireylerin daha nitelikli kararlar almasına yardımcı olarak yaşam kalitesini yükseltmektedir. Eleştirel düşünce neye inanılıp inanılmaması ya da neyin yapılp yapılmaması gerektiğine odaklanılan bir yansıtıcı düşünme becerisidir (Ennis, 1989). Eleştirel düşünme öğretimi ile ilgili olarak alanyazında konu temelli ve beceri temelli olmak üzere iki temel yaklaşım bulunmaktadır (Aybek, 2007).

Bir diğer üst düzey düşünme becerisi analitik düşünmedir. Analiz kelimesi Yunanca kökenli bir kelime olup bir şeyi en küçük parçalarına ayırma anlamına gelmektedir. Analitik düşünme ise karar verme ve problem çözme süreçlerinde bu parçaları tekrar bir araya getirebilme becerisidir. Bloom'un yenilenmiş taksonomisi 'analiz'i bir materyali parçalarına ayırma ve bu parçaların bütünle nasıl bir ilişkisi olduğunu belirleyebilme olarak tanımlamaktadır (Anderson et al., 2014). Alanyazında analitik düşünme öğretimi genellikle problem çözme becerileri ile ilişkilendirilmektedir.

Bu çalışma; 2020-2021 akademik yılı bahar döneminde, bir devlet üniversitesindeki eğitim fakültesinde Covid-19 uzaktan eğitim koşullarında çevrim içi yürütülmüş olan "Eleştirel ve Analitik Düşünme" (EAD) dersine yönelik öğretmen adaylarının görüşlerini anlamayı amaçlayan bir çalışmadır. EAD bu kurumda ilk defa verildiği için dersin geliştirilebilmesi adına öğretmen adaylarının görüşlerinin bilimsel bir araştırmayla ortaya konması amaçlanmıştır. Bu genel amaç doğrultusunda cevap aranan diğer sorular ise:

- 1- Öğretmen adaylarının EAD dersinin kendilerinin düşünme becerilerini geliştirip geliştirmediklerine ilişkin genel görüşleri nelerdir?
- 2- Öğretmen adaylarının EAD dersinde gerçekleştirdikleri eleştirel ve analitik düşünme etkinliklerinin başarılı olup olmadığına ilişkin görüşleri nelerdir?
- 3- Öğretmen adaylarına göre EAD dersinin güçlü ve zayıf unsurları nelerdir?
- 4- Öğretmen adaylarının düşüncelerine dayalı olarak eğitim fakültelerinde okutulması öngörülen bir EAD dersinin özellikleri nelerdir?

## Yöntem

Bu çalışma, analitik araştırma olarak desenlenmiştir. Nicel ve nitel araştırma biçiminde sınıflandırılmayan araştırmalar analitik araştırmalar olarak adlandırılmaktadır (McMillan, 2004). Analitik araştırmalar; araştırma konusu ile ilgili doküman, belge ve kayıtların olaylar, düşünceler ve kavramlar bağlamında incelendiği bir araştırma yöntemidir (Ersoy, 2015). Araştırmanın gerçekleştirilebilmesi için 07.06.2021 tarihli ve 69559 no'lu Etik Kurul izin belgesi alınmıştır.

### Katılımcılar

Araştırmanın çalışma grubunu EAD dersine kayıtlı olan toplam 176 öğretmen adayı oluşturmaktadır. Araştırmacı tarafından geliştirilen Eleştirel ve Analitik Düşünme Anketi (EADA) ile Eleştirel ve Analitik Düşünme Yazılı Görüşme Formu (EADGF) dersi alan tüm öğretmen adaylarına internet ortamında gönderilmiştir. Gönüllü olan 78 öğretmen adayı anketi doldurmuş ve araştırmacıya geri göndermiştir.

### Veri Toplama Araçları ve Analizi

EADA'da 30 adet beşli Likert tipi anket maddeleri bulunmaktadır. EADGF'de ise sekiz yarı-yapılandırılmış görüşme sorusu bulunmaktadır. EADA'nın analizinde betimsel istatistikten yararlanılmıştır. Araştırmanın nitel verilerini oluşturan yazılı görüşmelerin analizi ise tematik analizle gerçekleştirilmiştir (Braun ve Clarke, 2006). Anketten ve görüşmelerden elde edilen bulgular nitel olarak öğretmen adaylarının açık uçlu anket maddesine verdikleri yanıtlarla desteklenmiş ve böylelikle veri çeşitlemesi sağlanmıştır.

## Bulgular

### EADA'dan Elde Edilen Bulgular

Öğretmen adayları dersten beklentilerinin karşılandığını ifade etmiştir. Bu bulgu öğretmen adaylarının ders tanıtımında yazan bilgilerle dönem boyunca gerçekleşen uygulamaların ve sunulan içeriğin örtüştüğünü düşündüklerini göstermektedir. Öğretmen adayları ders içeriğinin zengin ve yeterli olduğunu, bunun yanında dersin mesleki gelişimlerini desteklediğini düşünmektedir. Öğretmen adayları eleştirel ve analitik düşünme becerisinin sınıflarda nasıl uygulanabileceğine ve kazandırılabilmesine yönelik örnekler ve etkinlikler üzerinde çalışmıştır ve bu etkinlikleri oldukça faydalı bulmuştur. Öğretmen adayları EAD dersi sayesinde eleştirel ve analitik düşünme becerilerini, eleştirel okuma ve yazma becerilerini, yansıtıcı ve yaratıcı düşünme becerilerini geliştirdiklerini, medyadaki propaganda unsurlarını algılayabildiklerini, kendilerini daha iyi tanıyabildiklerini, sınıflarında eleştiri ve demokrasi kültürünün yerleşmesi için neler yapmaları gerektiğini öğrendiklerini ifade etmiştir.

### Nitel Verilerden elde Edilen Bulgular

Yazılı görüşmelerin içerik analizi sonucunda beş temel temaya ulaşılmıştır; 1) kendini tanıma ve öz-değerlendirme, 2) verimli ve faydalı bir ders, 3) keyifli bir ders, 4) öğretmenlik mesleği ve günlük yaşama aktarılacak bilgi, beceri ve deneyimler, 5) dersin geliştirilmesine yönelik öneriler. Bu beş tema EADA'dan elde edilen verilerle benzerlik göstermekle birlikte farklı olan tema dersin geliştirilmesine yönelik önerilerdir. Bunlardan ilki "film veya kitap/roman eleştirisi"dir. Öğretmen adayları dönem başında belirlenecek olan düşündürücü kitap ya da filmlerin eleştirel

bir bakış açısıyla değerlendirilmesini ve dersin değerlendirme sistemine eklenmesini önermiştir. İkincisi, eleştirel ve analitik düşünme becerilerinin sınıf içinde uygulanmasına yönelik "uygulama etkinliklerinin" daha uzun süreye yayılmasıdır. Üçüncü öneri "derse katılım ve etkileşim"dir. Öğretmen adayları dersin uzaktan eğitim yoluyla ve çevrim içi yapılmasından kaynaklı bazı teknik sıkıntılar yaşadıklarını ve bunun öğretmen-öğrenci etkileşimini olumsuz etkilediğini belirtmişlerdir. EADA'daki açık uçlu soruya verilen yanıtlar da bu bulguları desteklemektedir.

### **Tartışma, Sonuç ve Öneriler**

Araştırma bulguları, alanyazında öğretmen adaylarının düşünme becerilerinin geliştirilmesine yönelik çalışmaların bulgularıyla benzerlik taşımakta ve bu becerilerin geliştirilebilir olduğunu göstermektedir (Akkuş-Çakır ve Senemoğlu, 2016; Aybek, 2007; Cantürk-Günhan ve Başer, 2009; Tok ve Sevinç, 2010). Öğretmen adayları EAD dersini önemsemekte ve eğitim fakültelerinde zorunlu bir ders olması gerektiğini düşünmektedir. Bütün bu bulgular dersin başarılı olduğunun göstergesi kabul edilebilir.

Öğretmen adayları EAD dersinin toplumsal kalkınmaya destek olacağına inanmaktadır. Öğretmen adayları öğrencilerinin her alanda üst düzey düşünme becerilerini kullanabilmesini sağlayarak daha iyi düşünebilen bir neslin yetiştirilmesine katkı sağlayabileceklerini düşünmektedir. Araştırmanın bulguları öğretmen adaylarının eleştirel, analitik ve yansıtıcı düşünme, eleştirel okuma ve yazma gibi üst düzey düşünme becerilerini geliştirdiğini ortaya çıkarmıştır. Bunun yanında öğretmen adayları bu becerileri kendi disiplinlerinde ders kazanımları ile ilişkilendirerek nasıl öğretebileceklerini öğrendiklerini ifade etmiş ve dersin kuram ve uygulamayı bütünleştirdiğini belirtmişlerdir.

EAD dersi Covid-19 pandemi ve uzaktan eğitim koşullarında çevrim içi olarak gerçekleştirilmiştir. Bu ise derse sesli katılımı sınırlandırmıştır. Öğretmen adayları ev koşullarında olmalarından dolayı kimi zaman mikrofonlarını açmaktan çekinmiş ve bu durum derslerin bazen yalnızca belli öğrencilerin katılımıyla ya da öğretmen merkezli işlenmesine neden olmuştur.

Araştırmadan elde edilen bulgular doğrultusunda örnek bir EAD dersi önerilmektedir. Önerilen uygulamalar yüz yüze, çevrim içi, harmanlanmış ya da ters-yüz edilmiş öğrenme ortamlarında öğretim elemanın yaratıcılığı, eğilimleri ve sahip olduğu teknik ve fiziki koşullara göre farklı biçimlerde gerçekleştirilebilir. Ayrıca, diğer eğitim fakültelerinde farklı öğretmen adaylarıyla gerçekleştirilecek çalışmalar da bu ders bağlamında öğretmen adaylarının düşünme becerilerinin geliştirilmesine katkı getirecektir.



## Curriculum Content Proposal for Integration of Technology in Education

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### Abstract

This study focuses on the content of technology-related courses offered by teacher training institutions to determine the factors that will avoid technology integration in teacher education/training. Two methods are combined in the research. As a first step, the integration of technology in education/teaching models literature was analyzed, synthesized, and categories were created based on the critics. Next, technology-related courses in teacher training curricula were defined, the content of those courses was analyzed, and some content and suggestions were proposed for better technology-integrated courses. Even though literature indicates the most critical barriers to technology integration in education are hardware problems and the lack of technical infrastructure, one of the underlying factors is the teachers' inadequacy in ICT, the usage of technology in education, and technology integration literacy. These inadequacies are the result of the training curriculum deficiencies. There are three suggestions based on the findings and for further studies. The first one is to add courses and contents to the teacher-training curriculum as discussed in interpretation and discussion. Secondly, instructional technology courses should have specific content related to the content area. The syllabus should be developed with the cooperation of the content area teacher trainer for each subject area. Finally, as a part of curriculum development, these proposed courses and their content should be reevaluated for further studies.

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## Introduction

Integrating technology in education can only create an engagement between technology and the learning-teaching process. The teacher is critical for integrating technology in education/teaching, and the initial point is teacher-training institutions. Although teachers and teacher trainers must be technology literate to ensure technology integration in education/teaching, more is needed to be ICT literate to use this literacy effectively in teaching activities. It should be remembered that a person's technology qualifications and the ability to use technology in teaching require different competencies.

Some research indicates that even though teachers have some ICT skills, they do not have specified skills to transfer those skills to educational settings (Kim, Kim, Lee, Spector & DeMeester, 2013; Llorens, Salanova, & Grau, 2002; Ottenbreit-Leftwich, Glazewski, Newby, & Ertmer, 2010). Other studies emphasize that pre-service teachers born in the digital age can use essential information technologies daily (Kennedy, Judd, Churchward, Gray, & Krause, 2008). However, their knowledge and skills could be more extensive in subjects that require higher level skills, such as blogs, wiki, and Web 2.0 technologies (Jones, Ramanau, Cross, & Healing, 2010; Marganyan, Littlejohn, & Vojt, 2011). Similarly, many studies report those teacher trainers, who already have basic technological skills and have a positive attitude toward using technology in teaching, have minimal technology experience and do not use technology enough in their lessons (Carroll & Morrell, 2006; Dinçer & Yeşilpınar-Uyar, 2016; Drent & Meelissen, 2008; Instefjord & Munthe, 2017; O'Brien, Aguinaga, Hines, & Hartshorne, 2011).

The teacher trainers, as role models for pre-service teachers, and the pre-service teacher should know and use instructional technology in classroom settings to eliminate those limitations (Carroll & Morrell, 2006; Groth, Dunlap, & Kidd, 2007; Matthew, Stephens, Callaway, Letendre, & Kimbell-Lopez, 2002; Uerz, Volman, & Kral, 2018). For example, Drent and Meelissen (2008) underline that teachers gain experience in ICT by using it. Therefore, they suggest that teacher trainers increase their competencies by using ICT in classroom settings and be models to pre-service teachers. Therefore, pre-service teachers should first be trained in ICT literacy (Agyei & Voogt, 2011; Drent & Meelissen, 2008; Sang, Valcke, Braak & Tondeur, 2010) and then focus on how to use ICT in their subject area's teaching (Angeli & Valanides, 2005). Despite these requirements, many countries' teacher training curricula do not include enough ICT literacy and ICT integration in the subject area of teaching (Gudmundsdottir & Hatlevik, 2018; Instefjord & Munthe, 2017; Tømte, Enochsson, Buskvist, & Kårstein, 2015; Tondeur, et al., 2012).

One of the many reasons to engage more with ICT training is the interchangeable usage of ICT in teaching and ICT integration in the teacher training curriculum. Even though there are several ICT literacy definitions and standards created by many organizations (ACER, 2008; ISTE, 2021; OECD, 2005; 2013), these definitions and standards focus on the usage of ICT in instruction (ACER, 2008; ISTE, 2021; OECD, 2013). Dinçer (2021a) points out that using ICT in instruction is about using ICT technologies in the instruction process, and it does not include any detail-oriented activity. However, integrating technology in education/teaching sets up technology as the main component of instruction. Using a smartboard instead of a blackboard is a specific example of using ICT in instruction. It facilitates instruction. However, the aim of using the material could be more innovative; that is, using a blackboard instead of a

smartboard does not create any significant change in the system. Considering smartboards as a part of the curricula, saving activities and making them available online through learning management systems can be considered ICT integration in education/teaching. Technology plays a critical role in this scenario as a well-defined part of curricula, supporting learning opportunities at out-of-school times; the absence of technology may result in a learning loss. Teacher training curricula have some elements of the basic skills of ICT, such as introductory ICT literacy courses and the usage of ICT in instruction. However, as mentioned above, the usage of ICT in instruction and the technological pedagogical usage of ICT are very different concepts, and the second requires better-fitted curricula and models for integration.

Mishra and Koehler (2006) underline the importance of the intersection of content knowledge and ICT literacy through their Technological Pedagogical Content Knowledge [TPACK] framework. Technology, pedagogy, and content knowledge are described as three individual components of teaching, and technology integration in education is possible only by creating an intersection among them.

They define the components

and the variables related to TPACK (Rodríguez Moreno, Agreda Montoro, & Ortiz Colón, 2019). In the recent TPACK literature, establishing a theoretical framework or TPACK's relationship with different content area teacher training curricula is looked into (Chaipidech, Kajonmanee, Chaipah, Panjaburee & Srisawasdi, 2021; Tzavara & Komis, 2015). However, they focus on the theoretical component of the model or the case studies instead of using specific models. Also, empirical studies have conducted research with self-report scales instead of knowledge or skill tests (Dinçer, 2018; Dinçer & Doğanay, 2015; Dinçer & Doğanay, 2017; Hohlfeld, Ritzhaupt, Barron, & Kemker, 2008).

In summary, the TPACK model is essential for integrating technology into education. However, there are gaps in the literature about how this model fits different content area teaching, how appropriate curricula will develop for the intersection of technology, pedagogy, and content knowledge, and how the model should be assessed. TPACK model requires a specific teacher training curriculum for different content areas to integrate technology so that teachers may use technology effectively for different content areas in their classroom practice. For example, the integration of technology in education/teaching may vary between content like social science or science teaching. However, how this integration will occur in those different content areas is still being determined.

Teacher qualifications should be revised according to the usage of technology and the technology-integrated instruction to apply the TPACK model and to have better technology integration to teacher training curricula (Drent & Meelissen, 2008; ISTE, 2021; Tondeur, Aesaert, Pynoo, van Braak, Fraeyman, & Erstad, 2017; Uerz et al., 2018). Like many other countries, Turkey has some technology-related courses in its teacher training curriculum; however, those courses are limited to basic ICT literacy skills. Having courses limited to ICT literacy skills is one of the most critical barriers to integrating technology into education. It is necessary to understand the other barriers to the integration of technology in education in the Turkey context and propose some courses to teacher training institutions.

This research aims to suggest the content of technology-related courses in teacher training institutions by determining the factors preventing technology integration in education/training. For this purpose, answers to the following questions were sought:

- 1) What are the main factors hindering technology integration in education/training?
- 2) What is the content of the technology-related courses of teacher training institutions in Turkey?
- 3) How can the curriculum be developed to fully integrate technology into education in teacher training institutions in Turkey?

## **Method**

### **Research Model**

Developing a model for instruction goes far beginning of the teaching act. It progresses by either revising the former model or proposing a model from scratch. For example, Halloun (2007) states that developing a model can occur by "analyzing the data from the field" or "doing a critical review of the literature and creating a synthesis."

In this study, both methods are combined. As a first step, the literature about the integration of technology in education/teaching models literature was analyzed, synthesized, and categories were created based on the critics. Next, technology-related courses in teacher training curricula were defined, the content of those courses was analyzed, and some content and suggestions were proposed for better technology-integrated courses.

### **Data Collection and Analysis**

There were two steps for data collection. First, the literature about technology integration in education/teaching models (2016-2020) was coded for synthesis by the document analysis method. Second, technology-related courses in teacher training curricula were examined, and the course's aims and content were coded.

There were 42 studies as a result of a search with the keywords of "integration of technology in education/teaching," "technology integration in education/teaching," "education/teaching with technology," and "barriers/limitations." In parallel with the research question, the results of the studies in the literature were grouped and coded according to the main factors that prevent technology integration in education/training.

## **Results**

The categories of barriers to technology integration in education are summarized below in Table 1. As Table 1 indicates, the significant barrier to integrating technology in education is the lack of infrastructure, such as computers, and the internet connection pace (f=43). The other barriers, by order, are teachers' and students' ICT literacy level (f=42), insufficient content (f=17), and teachers' and students' literacy level of integration of technology in education/teaching (f=4).

Literature regarding technology integration in education/teaching indicates that studies focus on TPACK Model for technology integration. There was no critical perspective toward the

TPACK model; however, there are limitations due to ambiguous knowledge about integrating pedagogical content knowledge with technology.

The studies focus on teachers' and pre-services teachers' ICT usage, or integration, which has severe critics and points out some significant limitations. Those limitations and critics can summarize as "the inappropriate assessment tools" (f=22), "the ambiguous models especially for different content areas' specific nature" (f=15), and "the lack of prescription about applying technology in specific content knowledge" (f=13). Most studies are based on self-report tools and measure attitudes, neither knowledge nor skills.

Table 1. *The barriers to technology integration in education are mentioned in the literature.*

<i>Categories</i>	<i>f</i>
The lack of the infrastructure	43
Teachers' ICT literacy level	24
Students' ICT literacy level	18
Insufficient content	17
Teachers' literacy level of integration of technology in education/teaching	2
Students' literacy level of integration of technology in education/teaching	2

Turkish Higher Education Council's (YÖK, 2018) curriculum for the faculty of education is examined to review to what extent teacher training curricula are adapted to technology-integrated teaching. There are two standard courses in all teacher training curricula. One of those courses is three hours per week, and the other is two hours per week courses (ICT, instructional technologies). Those courses' content is described below:

*Information Technologies:* Information and communication technologies and computational thinking; the concepts and approaches to problem-solving; algorithms and flow diagrams; computer systems; the basic concepts about the hardware and the software; the basics of operating systems; up-to-date operating systems; file management; utility programs (third party software); word-processing software; computing/tabling/graphic software; presentation software; desktop publishing; database management systems; web design; the usage of internet in education; communication and cooperation technologies; internet security; communication and technology ethics and copyright issues; the effects of computer and internet on children/teenagers.

*Instructional Technologies:* Information technologies in education; the teaching process and the classification of instructional technologies; the theoretical approaches towards instructional technologies; the instructional technologies as a tool and a material; the instructional technology design; to design a thematic instructional technology; to create an object warehouse to the specific subject area; the criteria to assess an instructional material.

## **Discussion, Conclusion, and Implications**

With the development of technology, teaching materials change, which requires the revision of teacher competencies (Drent & Meelissen, 2008; ISTE, 2016; 2017; Tondeur et al., 2017; Uerz

et al., 2018). For integrating technology in education/teaching, technology literacy and the use of technology in education must be taught in teacher education. There are many studies in the literature on the technology literacy of teachers and pre-service teachers (Aldunate & Nussbaum, 2013; Uerz et al., 2018; Webb & Cox, 2004). However, only some of these studies examine the variables of technology integration in education (Drent & Meelissen, 2008; Groth et al., 2007; Mishra & Koehler, 2006; Uerz et al., 2018). Most of the studies focus on the instruction-technologies relationship with different variables to investigate the effect of instructional material on students' achievement; the skills of teachers or prospective teachers need to be examined in depth. It is a fact that teachers must first be technology literate in order to use them, especially technology-related materials. Dinçer (2021b) indicates that ICT literacy is insufficient to use those technologies as material or for any other purpose in the instruction process. ICT literacy does not necessarily mean teachers have the skill set to use technology in instruction. Teachers should have the skills to use these technologies in their teaching activities as well as the skills to use these technologies in their teaching activities.

In order to fully understand the situation, as mentioned earlier, it is necessary to understand the difference between technology use and integration in education/training. The use of technology in education or teaching and integrating technology in education/teaching represent two different situations. The use of technology in education/teaching refers to the direct use of the elements/factors expressed by technology in education or teaching activities; in other words, there is no complicated situation regarding the use of these technologies. However, it states that integrating technology in education/teaching has become one of the teaching activities' main factors/elements. For example, using the interactive whiteboard instead of the blackboard in teaching activities is the use of technology. It provides convenience in teaching activities but will not provide any innovation or severe convenience in terms of its intended use. In other words, bringing the blackboard instead of removing the interactive whiteboard from the teaching environment will not make a meaningful difference. They are learning management systems by including the interactive whiteboard in the curriculum and recording their use. Making it accessible to students with applications can be an example of integrating technology in education/teaching. The critical role here is for the learners to use this element in their extracurricular activities by clearly specifying the material in the curriculum; Using the interactive whiteboard may help the teaching activities.

Table 1 indicates that at first sight, the most critical barrier is hardware and infrastructure; however, the underlying barriers are teachers' limited technology usage and low literacy in using ICT. Dotong, De Castro, Dolot, and Prenda's (2016) study support this perspective, especially in under-developed and developing countries. As a result, teacher-training curricula should be updated to facilitate teachers' technology usage in instruction and their ICT-integrated teaching. Those updated curricula should include three dimensions ICT literacy, the usage of technology in education, and the integration of technology in education/teaching. Research indicates that even ICT-literate teachers may not use technology in educational settings (Georgina & Olson, 2008; Uerz, etc., 2018). As a result, having these three dimensions is the bare minimum for technology integration in education.

In Turkey, teacher training curriculum, there are only two courses related to technology, and their content is so limited. As a piece of evidence, the Turkish Higher Education Council (YOK, 2018) announced that those two courses' syllabi' are the same for all different content areas,

which is contrasted with the perspective of the recently discussed technology integration model, TPACK. The TPACK model indicates that different content areas use different pedagogical methods and technologies. "The Methods and Principles of Teaching" course in the teaching training curriculum can be considered as creating an intersection for different content areas, pedagogy, and technology integration. However, this course also has a standard description, aim, and content for all content areas, suggesting otherwise.

The discussions so far can be summarized as the teacher training curriculum in Turkey requires an update on technology-related courses from both the number and the content perspective. This update may constitute as such: After taking "The information and Communication Technologies" course, there can be a course for three credits (Theory: 2 hours, Practice: 1 hour) "The usage of technology in education and instruction." This course should focus on the relationship between the related content area and its pedagogical practices instead of broad and narrow content related to technology. The proposed courses' goals and content are described below:

*The information and communication technologies content:* The up-to-date operating systems; file management; internet search; ICT security and ethics; social media literacy; word-processing software; computing/abling/graphic software; presentation software; database management systems.

*The information and communication technologies goals:*

Students,

- be able to describe operating systems and software,
- be able to achieve files based on a system,
- be able to open different file types with appropriate software,
- be able to use advanced search engines to reach out for specific information,
- be able to question the information source and use reliable sources,
- willing to follow up on ethical codes about information and communication technologies,
- be able to create a formatted document with word-processing software,
- be able to create a formula by computing/abling/graphic software,
- be able to create a presentation with presentation software.

*The usage of technology in education and instruction content:* Teaching management systems, cloud services, searching information, communication technologies, digital typography, the practice of third-party digital tools (projection, smart board), the necessity of technology in education.

*The usage of technology in education and instruction goals:*

Students;

- be able to list learning management systems' goals,
- be able to use learning management systems,
- be able to share the file through cloud systems,

- be able to use the proper sources to reach out for information,
- be able to create and manage groups through communication technologies (forum, e-mail, mobile phone applications)
- be able to typeset by word-processing software,
- be able to set up third-party digital tools,
- be able to use third-party digital tools in education,
- be able to use proper technology,
- be able to assess a chosen technology from a cost-effective perspective.

The content of the instructional technologies course should be changed for the pre-service teachers who have gained basic literacy on the use of technology, and it should be added to the content of technology integration in education. However, these contents are different in all fields. The ones related to the use and integration of field-specific technology are added to the curriculum as a five-hours (Theory: 3 hours, Practice: 2 hours) practical course. In this context, it is suggested to determine the course content and achievements as follows:

*Instructional technologies course content:* Teaching process and classification of instructional technologies; theoretical approaches to instructional technologies; the relationship between pedagogy and technology; application of instructional technologies in instructional design; material design processes; designing site-specific materials; technology integration in education/training; domain-specific measurement and evaluation using technology.

*Instructional technologies course goals:*

Students,

- be able to classify instructional technology,
- be able to explain theoretical approaches related to instructional technologies,
- be able to List the material design processes,
- be able to design material specific to the field,
- be able to use instructional strategies that combine content, technologies, and instruction
- be able to develop course content (instructional software, educational games) by using technology in teaching;
- be able to develop assessment tools through technology.

### **Conclusion and Suggestions**

Even though literature indicates the most critical barriers to technology integration in education are hardware problems and the lack of technical infrastructure, one of the underlying factors is the teachers' inadequacy in ICT, the usage of technology in education, and technology integration literacy. These inadequacies are the result of the teacher training curriculum's deficiency.

It is suggested,

- To add courses and contents to the teacher training curriculum as discussed in interpretation and discussion.
- Instructional technology courses should have specific content related to the content area. The syllabus should be developed with the cooperation of the content area teacher trainer for each subject area.
- As a part of curriculum development, these proposed courses and their content should be reevaluated for further studies.

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## TÜRKÇE GENİŞ ÖZET

### Eğitimde Teknoloji Entegrasyonu İçin Öğretim Programı İçerik Önerisi

#### Giriş

TPACK Modeli teknoloji entegrasyonunda önemli bir aşamadır; ancak modelde, özellikle farklı disiplinlerde, teknoloji pedagoji ve alan bilgisi kesişimlerini içeren öğretimlerin nasıl yapılabileceğine ilişkin uygun bir öğretim programı önerilmemiştir; model çıktılarının nasıl ölçülmesi gerektiği ve modele ilişkin öğretim programlarına yer verilmemiştir. Öğretmenlerin öğretim faaliyetlerinde teknolojiyi etkin kullanabilmeleri için öğretmen eğitimi sırasında teknolojiyi alanlarına göre entegre edebilmelerini sağlayacak öğretim programına ihtiyaçları vardır ki bu durumun nasıl sağlanacağı TPACK Modeli'nde açık olarak belirtilmemiştir.

TPACK Modeli'nin uygulanabilmesi ve teknoloji entegrasyonunun sağlanması teknoloji kullanımı ve entegrasyonu içerikli öğretmen yeterliklerinin revize edilmesini gerektirmekte (Drent ve Meelissen, 2008), öğretmen yetiştiren kurumların öğretim programlarının buna göre tasarlanması gerekmektedir. Türkiye'deki eğitim fakültelerinde bilgisayar ve teknoloji içerikli öğretim programlarının içeriği bulunmasına rağmen bu programlar temel bilgisayar okuryazarlığı seviyesinde sınırlı kalmaktadır. Eğitimde teknoloji entegrasyonunun önündeki en büyük problemlerden birisi de budur. Bu problem durumunu aşmak için eğitimde teknoloji entegrasyonuna engel teşkil edecek diğer faktörlerin de belirlenerek öğretmen yetiştiren kurumların teknoloji ile ilgili derslerine ilişkin öğretim programı geliştirilmesi gerekmektedir.

Yukarıda değinilen sorunlar göz önüne alınarak bu çalışmada eğitimde/öğretimde teknoloji entegrasyonuna engel teşkil edecek faktörler belirlenerek öğretmen yetiştiren kurumların teknoloji ile ilgili derslerine ilişkin içerik önerilmesi amaçlanmıştır.

#### Yöntem

Halloun (2007) model geliştirmenin "araştırma sürecinde elde edilen verilerin analizi ile" ya da "literatürdeki belirtmelerin eleştirel bir biçimde analiz edilmesi ve sentezlenmesi" ile yapılabileceğini belirtmiştir. Bu araştırmanın yöntemi ise iki yaklaşımın sentezlenmesi ile kurgulanmıştır. Öncelikle teknoloji entegrasyon modelleri ile ilgili literatürdeki çalışma sonuçları analiz edilerek sentezlenmiş, eleştiriler kategorilendirilmiştir. Daha sonra teknoloji içerikli dersler belirlenerek ders içerikleri analiz edilmiş, eğitimde teknoloji entegrasyonunun sağlanabilmesi için içerik ve öneriler sunulmuştur.

#### Bulgular

Son beş yıldaki ilgili literatür taranmış, incelenen 42 çalışmada belirtilen teknolojinin eğitimde entegrasyonu önündeki engeller kategorileştirilmiştir. Tablo 1'de de görüldüğü üzere engellerin başında bilgisayar, internet hızı vb. teknik ekipmanların yetersiz olduğu (f=43)

bulgusu elde edilmiştir. Diğer engeller ise sırasıyla öğretmen ve öğrencilerin teknoloji okuryazarlıklarının yeterli düzeyde olmaması (f=42), içerik yetersizliği (f=17) ve öğretmen-öğrencilerin eğitimde teknoloji entegrasyonu okuryazarlık düzeylerinin düşük olması (f=4), olarak belirlenmiştir.

Öğretmenlerin ya da öğretmen adaylarının eğitimde teknoloji kullanımı ya da entegrasyonunu inceleyen çalışmalarda ise ciddi eleştirilerin ve sınırlılıkların olduğu tespiti yapılmıştır. Bu eleştiri ve sınırlılıklar "ölçme araçlarının uygun olmaması" (f=22), "modellerin özellikle alanların farklı durumlarına özgü yapı kullanımının net olmaması" (f=15), "teknolojinin alan bilgisine özgü yönerge içermemesi" (f=13) şeklinde sıralanmıştır. Çalışmaların hemen hepsinde ölçmenin öz değerlendirme şeklinde yapıldığı, bilgi ya da beceriyi değil algıyı ölçtüğü bulgusuna erişilmiştir.

### **Tartışma, Sonuç ve Öneriler**

Öğretimde teknoloji entegrasyonu için bu bağlamda teknoloji okuryazarlığının ve teknolojinin eğitimde kullanımına ilişkin öğretimlerin, öğretmen eğitiminde verilmesi önemlidir. Literatürde öğretmenlerin ya da öğretmen adaylarının teknoloji okuryazarlıkları ile ilgili çok sayıda çalışma mevcuttur (Aldunate ve Nussbaum, 2013; Uerz vd., 2018; Webb ve Cox, 2004). Ancak bu çalışmaların az bir kısmı eğitimde teknolojinin entegrasyonunun değişkenlerini incelemektedir (Drent ve Meelissen, 2008; Groth ve diğ., 2007; Mishra ve Koehler, 2006; Uerz vd., 2018). Literatürdeki eğitim-teknoloji ilişkisini araştıran çalışmalar incelendiğinde çalışmaların genellikle dijital materyallerin öğrencilerin akademik başarılarına etkisini inceleme boyutunda kaldığı, öğretmenlerin ya da öğretmen adaylarının bunları kullanma becerilerinin derinlemesine incelenmediği görülmektedir. Başta teknoloji ile ilişkili materyaller olmak üzere, bunları kullanmak için öğretmenlerin öncelikle teknoloji okuryazarı olması gerektiği bir gerçektir. Dinçer (2021a) ister materyal boyutunda olsun ister diğer boyutlarda olsun, teknolojinin öğretimde kullanılabilmesi için sadece teknoloji okuryazarı olunmasının yeterli olmadığı sonucuna erişmiştir. Öğretmenlerin teknoloji okuryazarı olma gereklilikleri gibi bu teknolojileri öğretim faaliyetlerinde kullanabilecekleri becerilerinin de olması gerekmektedir.

Eğitimde/öğretimde teknoloji kullanımı ve entegrasyonunun farkının anlaşılması gerekmektedir. Öğretimde teknoloji kullanımı ve öğretimde teknoloji entegrasyonu iki farklı durumu ifade etmektedir. Öğretimde teknoloji kullanımı, teknoloji ile ifade edilen unsurların öğretim faaliyetlerinde doğrudan kullanılmasını ifade eder; yani bu teknolojilerin kullanımı açısından ayrıntılı bir durum söz konusu değildir. Ancak öğretimde teknoloji entegrasyonu kullanılan teknolojinin öğretim faaliyetlerinin ana unsurlarından biri haline gelmesini belirtmektedir. Örneğin etkileşimli tahtanın öğretim faaliyetlerinde sadece kara tahtanın yerine kullanılması öğretimde teknolojinin kullanılmasıdır. Bu durumun öğretim faaliyetlerinde bir kolaylık sağlayacağı açıktır, ancak kullanım amacı açısından bir yenilik ya da ciddi bir kolaylık sağlamayacağı ortadadır. Etkileşimli tahtanın öğretim ortamından kaldırılması yerine kara tahtanın getirilmesi anlamlı bir farklılığa yol açmayacaktır. Etkileşimli tahtanın öğretim programı içerisine dahil edilip, kullanımlarının kaydedilerek öğrenme yönetim sistemleri vb. uygulamalar ile erişimine açılması ise teknolojinin öğretime entegrasyonuna örnek verilebilir. Buradaki kilit rol materyalin öğretim programında net bir şekilde belirtilerek öğrenenlerin okul dışı etkinliklerinde bu unsuru kullanmaları gerekliliğidir; diğer bir deyişle etkileşimli tahta kullanılmaması öğretim faaliyetlerini aksatabileceğidir.

Tablo 1’de ilk sırada verilen sınırlılık, donanım ve alt yapı olarak görülse de ana engelin öğretmenlerin teknoloji kullanımı/entegrasyonu okuryazarlıklarının düşük olması olduğu düşünülmektedir. Dotong, De Castro, Dolot ve Prenda (2016) tarafından yapılan çalışmada da benzer bulgular bu düşünceyi destekler niteliktedir. Bu nedenle teknoloji kullanımı ve teknoloji entegrasyonuna yönelik öğretmen yetiştiren kurumlardaki programların güncellenmesi gerektiği anlaşılmaktadır. Bu programların teknoloji okuryazarlığı, öğretimde teknoloji kullanımı ve teknoloji entegrasyonu okuryazarlığı kapsamında üç boyutlu olarak ele alınması gerektiği düşünülmektedir. Bu düşünce bazı çalışmalarda teknoloji okuryazarı olursa da öğretim faaliyetlerinde teknolojinin tam kullanılmadığı bulgusuyla da desteklenmiştir (Georgina ve Olson, 2008).

Ulusal anlamda eğitim fakültelerinin programlarında belirtilen teknoloji içerikli derslerin iki tane olduğu bilinmekte ve içeriklerinin oldukça sınırlı olduğu düşünülmektedir. Örneğin tüm programlarda ders içerikleri YOK (2018) tarafından aynı şekilde verilmiştir ki bu literatürde TPACK Modeli olarak benimsenen modelin TCK yani teknoloji alan bilgisi alt bileşeni ile tezat bir yapı oluşturduğu şeklinde yorumlanmıştır. TCK her alanda farklı teknoloji kullanım bilgi ve becerisi gerektirdiği gibi bu bilgi ve becerinin öğretiminin de farklı olması gerektiği düşünülmektedir. “Öğretim İlke ve Yöntemleri” dersinin öğretim programında oluşu, bu düşüncenin karşısında olabileceği şeklinde yorumlanabilir; ancak, bu dersin de tüm programlarda aynı içerikle sunulması ve tüm yaklaşımları içermesi nedeniyle bu karşı düşüncenin geçerli olmayacağı düşünülmektedir.

Eğitim fakültesi lisans programlarının teknoloji ile ilgili derslerinin güncellenmesi gerekmektedir. Bu güncellenmenin eğitim-öğretimde teknoloji kullanımı ve teknoloji entegrasyonu başlıklarında iki farklı şekilde ele alınması gerektiği düşünülmektedir. Programda yer alan “Bilişim Teknolojileri” dersine ek olarak ikinci dönem de “Eğitim-Öğretimde Teknoloji Kullanımı” dersinin uygulamalı olarak üç saat şeklinde programa eklenmesi önerilmektedir. Teknoloji kullanımına ilişkin temel okuryazarlık kazanmış öğretmen adaylarına öğretim teknolojileri dersinin kapsamında değişiklik yapıp, ek olarak eğitimde teknoloji entegrasyonuna yönelik içeriklerinde eklenmesi önerilmektedir. Ancak içeriklerin tüm alanlarda aynı olmayıp, alana özgü teknoloji kullanımı ve entegrasyonuna ilişkin içeriklerin de eklenerek dersin uygulamalı olarak beş saat olarak programa eklenmesi önerilmiştir.

## Developing the Historical Thinking Skill Scale at the Secondary School Level

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### Abstract

This research aims to develop a set of scales that will allow the measurement of historical thinking skills of secondary school students. Expert opinion was used for the content and face validity of the scale, Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were used for the construct validity. A total of 817 students participated in the study, 497 of which were in the EFA study and 320 in the CFA study. As a result of EFA, a three-factor structure was obtained for each subscale which explained 55.57% of the total variance for the time and chronology perception (TCP) subscale; 52.04% of the total variance for the historical empathy (HE) subscale; and 49.01% of the total variance for the historical inquiry (HI) subscale. Findings from CFA showed that the subscales had sufficient fit indices and their reliability coefficients were within acceptable limits. Findings reveal that the scale can be used as a valid and reliable tool in determining students' historical thinking skills.

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## Introduction

In all societies, curricula are developed based on a certain philosophy, considering the socio-cultural infrastructure and skills individuals will need in the future. History is one of the basic fields at every level in these curricula. History learning is a field that includes many different acquisitions such as vocabulary learning, reference, memorization, comprehension, analysis, synthesis, reasoning, evaluation, and communication skills (Coltham & Fines, 1971). Thinking historically is one of the most basic skills acquired through history teaching and shaping the curricula (Demircioğlu, 2009; Keçe, 2015; Seixas, 2017). Although historical thinking is defined as “the process of using historical information, including context, perspective, perspective, and perceived facts, to understand the past” (Chowen, 2006, p. 11), it is a difficult phenomenon to be expressed in a single definition. Therefore, “historical thinking” is usually expressed in terms of the elements it covers or the skills expected to be acquired, rather than a specific definition (Seixas & Peck, 2004). For example, in Canada’s education system, according to Seixas and Colyer (2011), the historical thinking skills needed for teaching history include comprehending which events are valuable enough to be historical information (*historical significance*), trying to understand the source and evidence of historical information (*evidence*), change and continuity together with the awareness that there may be progress and regression in some areas (*continuity and change*), being able to see cause and effect relationships (*cause-effect*), being able to empathize with past events and people (*developing perspective*), and being able to develop moral judgments (*the ethical dimension of history*) considering the conditions of that period against the behavior of people in historical events. Historical thinking skills for students aged 4-12 in the American education system at the University of California (National Center for History in the Schools, [NCHS]) can be listed as follows (NCHS, 1996):

- Chronological thinking: Distinguishing concepts, grasping the distance of time, creating a timeline, explaining the change.
- Historical understanding: Being able to understand the information in sources such as historical texts, artifacts, and maps.
- Historical analysis and inference: Being able to ask questions for historical research, distinguish between real and fictional, think about historical events from multiple perspectives, and explain the causes of events.
- Historical research: Being able to obtain historical sources and develop explanations based on sources.
- Historical problem analysis and decision making: Being able to identify the problems experienced in the past, produce alternative solutions to the problems of that period, interpret in regard to the conditions of different people at that time, and evaluate the proposed solutions.

In the German education system, historical thinking is discussed as *asking historical questions, using sources with a methodological approach, making insights into the present based on historical events, synthesizing and organizing historical information, and having a level of historical knowledge to activate all these elements* (Levesque & Clark, 2018). Although a clear scope for historical thinking skills has not been determined in the Turkish education system, skills such as research, perceiving change and continuity, empathy, observation, recognizing

stereotypes and prejudice, using evidence, making decisions, and perceiving time and chronology, which are among the learning objectives of the social studies course for 4<sup>th</sup> and 7<sup>th</sup> grade students, include historical thinking skills (Ministry of National Education [MoNE], 2018). Within the framework of the 2018 social studies course curriculum, the *special aims* of the culture and heritage learning area expressed as “to determine the similarities and differences between people, objects, events, and phenomena by questioning the historical evidence of different periods and places, to perceive change and continuity” point to historical thinking skills. Similarly, in line with the Turkish Qualifications Framework, suggestions for emphasizing “reflective inquiry, past-present-future connection, time-continuity-change” in the social studies course are also aimed at historical thinking skills (MoNE, 2018).

Although historical thinking seems to be an achievement specific to history lessons at advanced grade levels, it has been understood that this thought is wrong and can be systematically taught early (Çulha-Özbaş, 2010). In different countries, it is seen that this skill is expressed as a skill that should be acquired starting from the 4<sup>th</sup> grade (NCHS, 1996). Since historical thinking is a complex skill that includes many elements, it becomes difficult to evaluate (Ercikan, Seixas, Lyons-Thomas & Gibson, 2015) and requires different approaches for its measurement (Ercikan & Seixas, 2015). Therefore, there is a need for tools that will provide evidence of the extent to which learning has taken place to support observation and other measurement tools. In this direction, while creating a framework for the historical thinking skills that especially secondary school students should have, it was aimed to develop a self-reported scale in line with this framework. The presented framework can also help to guide different measurement tools, observations, and curriculum development processes.

Curricula of different countries and related academic studies were examined in forming the framework of historical thinking skills. Historical thinking skills are associated with historical inquiry, using primary sources, collecting evidence, using evidence, and historical empathy in some studies (Drake & Brown, 2003). Aktın (2017) grouped historical thinking skills as understanding the past (developing perspective), perception of change and continuity, and historical empathy in examining the effects of museum visits on historical thinking skills. In general, chronological thinking (NCHS, 1996), historical comprehension (NCHS, 1996), and change and continuity (Seixas & Colyer, 2011) emphasize the ability to perceive time and chronology. In contrast, using evidence (Seixas, 2017), historical analysis and inference, research and decision making (NCHS, 1996), and synthesizing and organizing information using historical evidence (Levesque & Clark, 2018) points to historical inquiry. Furthermore, developing perspective (Chowen, 2006; Seixas & Colyer, 2011) and understanding perspective and context (Chowen, 2006) can be considered historical empathy. Similarly, in the national literature, historical thinking skills are discussed in a way that covers three basic skills: time and chronology perception, historical inquiry, and historical empathy (Akıncı-Güngör & Dilek, 2012; Çiviler, 2019; Demircioğlu, 2009; Dilek, 2002; Keçe, 2015). However, historical thinking skills, whose framework has been partially determined in the literature, are not expressed as a skill in the education curriculum of our country and are not presented with a unique framework (Demircioğlu, 2009). On the other hand, definitions such as questioning, having high interpretation power, analyzing, perceiving change and continuity, empathizing, and producing information based on historical evidence are frequently included in the social studies program (Yeşil, 2010). Therefore, time and chronology perception, historical inquiry, and historical

empathy, together with its sub-dimensions, formed the conceptual framework of the measurement tool to be developed in this study.

### **Time and Chronology Perception**

In the formation of historical thought, it is expected that the understanding of time should first be developed (Şimşek, 2007). Time is one of the basic components in history teaching, which tells the effect of historical events, beliefs, and thoughts that took place in the past by specifying place and time (Safran & Şimşek, 2006). Students' understanding of the present is possible if they understand the historical time well (Şimşek, 2006a). Understanding historical time helps students form their identity as citizens of a democratic society (Barton & Levstik, 2004). Not knowing the concepts of time and chronology makes history a set of independent phenomena (Demircioğlu, 2009) and prevents students' formation of a healthy historical consciousness (Özen, 2010). It also complicates the permanent and meaningful learning of historical information (Varlıkgörücü & Çalışkan, 2020). At this point, in order to teach history subjects better in the Social Studies course, students should have the ability to perceive time and chronology, and change and continuity (Demircioğlu & Akengin, 2011). The skills of perceiving time and chronology, as well as change and continuity, which are among the basic skills that are tried to be gained by students in social studies courses, support the healthy formation of time perception in children, enabling them to analyze and synthesize the changes that have taken place in history holistically (Şimşek, 2009).

The concept of historical time includes three components reflected in teaching: knowledge of chronology, chronology skill, and perception of change and continuity (Şimşek, 2006b). Chronological knowledge is presented in a sequence of events from the past, making it necessary to understand the cause-effect relationship between change (Sağlam, Tınaz & Hayal, 2015) and systematizes students' structuring of their historical knowledge (Akbaba, Keçe & Erdem, 2012). In other words, chronology is a more comprehensive work than listing historical events, which requires understanding past causes, effects, and change and continuity (Drake & Nelson, 2008). Chronology skill is the ability to position more than one event key to their dates, distance them in a temporal sense, and place the events in accordance with their priority-after status (Şimşek & Kolbasar, 2020). The ability to perceive change and continuity gives people the opportunity to put the time they live in, the events that have occurred in the past and present and the possible events that may occur in the future, in the right place in the history of humanity, and comprehend that humanity is in a constant change and continuity in this timeline (Seixas, 2017). It is very important to gain the ability to perceive change and continuity to create a healthy relationship between the past and the future (Demircioğlu & Akengin, 2011). In this way, individuals are primarily made aware of the change and the existing continuity over time through certain concrete developments (Safran & Şimşek, 2006). In addition, it is possible to understand and explain the facts and concepts much more deeply (Şimşek & Kolbasar, 2020).

### **Historical Inquiry**

Historical inquiry describes historians' process when examining historical sources (Leinhardt & Young, 1996). The skill of historical inquiry requires thinking like a historian (Seixas, 2001). Historians identify and interpret sources textually and historically through classification, verification, sourcing, and contextualization (Leinhardt & Young, 1996). Since teaching

historical subjects aim to reveal the skills of questioning and using evidence rather than content, skills such as empathy, associative thinking, imagination, and imagination can also be developed (Kıcı, 2006). Looking at the MoNE 2018 Social Studies curriculum, although "historical inquiry" is not expressed as a skill, the existence of skills such as observing, using evidence, making decisions, and identifying similarities and differences between people, objects, events, and facts by questioning historical evidence emphasizes the skill of historical inquiry (Çelikkaya & Boyraz, 2018; MoNE, 2018). In addition, historical inquiry can be expressed in diverse ways such as research skills based on historical inquiry (Akıncı-Güngör & Dilek, 2012; Demircioğlu, 2009), question-based history learning (Yeşil, 2010), and evidence-based history learning (Çulha-Özbaş, 2010).

The inquiry process includes planning (planning) and asking questions at the beginning of a research, followed by observation, inference, and explanation (interpretation) (Gutwill & Allen, 2012). In this sense, the skills that need to be developed in students can be questioning the source/evidence, using information, associating, and interpreting (Kıcı, 2006). Students with historical inquiry skills can ask historical questions, obtain data, question historical evidence, identify gaps and inconsistencies in the data they have collected, form a perspective by considering the period and place in which the historical sources were created with a contextual approach, carry out a qualitative analysis process, and compare their inferences with the sources (NCHS, 1996). Hicks and Doolittle (2008) developed a multimedia tool to guide university students to use historical inquiry skills. They presented five stages including, *summarizing* the historical inquiry process (planning, recognizing the source), *contextualizing* (considering the characteristics of the source), *inference* (commenting on the source, understanding the point of view), *monitoring* (determining the place of the sources in the research), and *confirmation* (comparing between the obtained sources, concluding the research).

### **Historical Empathy**

Students need to understand how the past shaped today's world and how the past and present differ from each other (Chapman, 2011; Wineburg, 2007). Historical empathy makes an important contribution to the development of historical understanding (Barton & Levstik, 2004; Seixas, 2012). It is one of the basic concepts in the field of social studies. Historical empathy enables students to criticize and analyze historical sources and to develop perspectives on experiences throughout history (Huijgen, Van Boxtel, Van de Grift, & Holthuis, 2017). The National Council of Social Sciences states that "historical understanding requires developing a sense of empathy with people in the past whose perspectives may be very different from today." (National Council for the Social Studies [NCSS], 2014, p.42). Enabling empathy skills (MoNE, 2018), which is one of the skills that should be gained between the 4<sup>th</sup> and 7<sup>th</sup> grade social studies curriculum also includes the phenomenon of the historical empathy (Gürsoylar, 2019). This skill area includes sub-skills such as "looking from a different perspective, being open-minded, understanding the feelings and thoughts of others, respecting differences, gathering around a common goal" (Kabapınar, 2007). In addition, empathy skill was considered as the historical empathy in the 2005 social studies curriculum (MoNE, 2005), and was

described as understanding the thoughts, goals and feelings of people in the past (Çelikkaya & Kürümoğlu, 2017).

Historical empathy is defined as an inclusive process that combines some historical figures cognitively and effectively to support students to understand and contextualize past events, thoughts, and logic (Kohlmeier, 2006). In an alternative definition, historical empathy is expressed as a process in which students try to reconstruct what they thought, the goals they achieved, and the decisions they made, considering the context of the time in which people who were influential in the past lived (Lee & Ashby, 2001). In this process, historical empathy skills make it easier for students to understand history and help them remember key facts and concepts (De Leur, Van Boxtel, & Wilschut, 2015). It also supports students to gain insight into multiple perspectives (Bartelds, Savenije & Van Boxtel, 2020) and develops citizenship competencies (Endacott & Brooks, 2013). In this way, it prepares students for their lives in a democratic society by helping them understand the complexity of forming ideas about the past and present, making decisions, and acting accordingly (Bartelds et al., 2020).

Bray (1905) states that historical empathy is a cognitive skill (cited in Karabağ, 2002). Indeed, historical empathy needs to be based on historical research and evidence (Lee & Ashby, 2001). However, McCully, Pilgrim, Sutherland and McMinn (2002) state that neglecting students' emotional reactions may be insufficient in helping them comprehend the past of their society and surface learning. Beyond this discussion, historical empathy can be expressed as a cognitive and sensory effort to understand history (Barton & Levstik, 2004). According to Endacott and Brooks (2013), historical empathy includes three components: historical contextualization (historical knowledge), affective empathy (construction of feelings of people in the past), and perspective-taking (historical perspective).

The ability to perceive time and chronology: *chronology knowledge, chronology skill, and perception of change and continuity* (Şimşek, 2006b); historical empathy: *historical contextualization, affective empathy, and perspective-taking* (Endacott & Brooks, 2013); and because it covers all the mentioned elements of historical inquiry and has more specific boundaries, Hicks and Doolittle's (2008) historical inquiry factors: *summary and planning, contextualizing and source inquiry, inference, monitoring, and confirmation*. While developing subscales those mentioned above, the three basic skills under historical thinking and the literature were considered. Based on this framework, it is aimed to develop a historical thinking skill scale at the secondary school level.

## Method

### Study Group

The research was conducted with 817 students (students selected from five schools with different socio-economic levels) 497 in the first stage and 320 in the second stage, in the 2021-2022 academic year. In the first stage, data were collected from 128 students receiving education in the fifth grade, 207 in the sixth grade, and 162 in the seventh grade. In the second stage, data were collected from 110 students in the fifth grade, 125 in the sixth grade, and 85 in the seventh grade. Table 1 presents gender and grade distribution of students participating in the study.

Table 1. Distributions of the sample for EFA and CFA

Grade level	Gender	First stage (EFA)	Second stage (CFA)
Grade 5	Female	65	50
	Male	63	60
Grade 6	Female	91	62
	Male	116	63
Grade 7	Female	81	39
	Male	81	46
Total		497	320

### Scale Development Process

During the development of the historical thinking skill scale set, the principles suggested by DeVellis (2021) for the scale development process were followed. The application principles stated by DeVellis (2021) for the scale development process are presented in Figure 1.

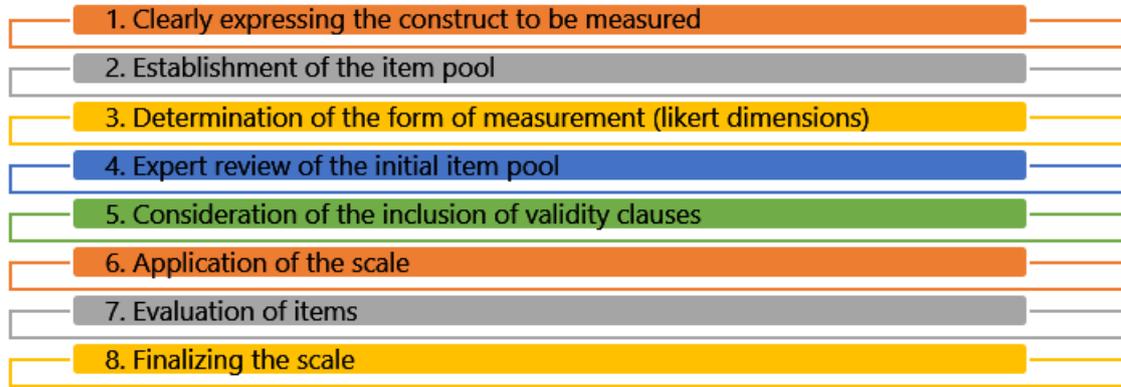


Figure 1. Scale Development Steps (DeVellis, 2021)

The historical thinking skill scale aims to measure the cognitive skills in the Culture and Heritage Learning Area related to the historical subjects in the secondary school social studies course. In this context, the scale was revealed within the time and chronology perception, historical inquiry, and historical empathy skills concerning the learning domain. The dimensions considered depending on the literature are presented in Figure 2 for each scale.

Scale	• Dimensions
<b>Time and Chronology Perception (Şimşek, 2006)</b>	<ul style="list-style-type: none"> <li>• Chronology information</li> <li>• Chronology skill</li> <li>• Perception of continuity and change</li> </ul>
<b>Historical Inquiry (Hicks &amp; Doolittle, 2008)</b>	<ul style="list-style-type: none"> <li>• Summarizing &amp; planning</li> <li>• Contextualization and source inquiry</li> <li>• Interpreting</li> <li>• Monitoring</li> <li>• Confirmation</li> </ul>
<b>Historical Empathy (Endacott &amp; Brooks, 2013)</b>	<ul style="list-style-type: none"> <li>• Historical contextualization</li> <li>• Affective empathy</li> <li>• Perspective-taking</li> </ul>

Figure 2. The Framework of the Subscales in the Scale

Based on the limited number of scales in the literature (Çalışkan & Demir, 2019) and the specified frameworks (Hicks & Doolittle, 2008; Şimşek, 2006b) for the historical thinking skill

scale set, there are three main themes: time and chronology perception, using historical inquiry and evidence, and historical empathy. An item pool was created for three separate subscales. Opinions of three social studies education experts, two history education experts, and three social studies teachers' opinions were sought regarding the statements in the item pool. A five-point Likert-type rating was used for the statements in the scale: *Strongly Agree* (5), *Agree* (4), *Neutral* (3), *Disagree* (2), and *Strongly Disagree* (1).

A total of eight experts, including one assessment and evaluation, four social studies education, three history education, and seven social studies teachers, were consulted to ensure the content and face validity of the historical thinking skill set. After making the necessary adjustments based on the experts' opinions, a 60-item scale was obtained by adding 9 items in line with the suggestions.

Cognitive interviews were conducted with 10 secondary school students (fifth, sixth, and seventh grades) to get feedback on the items' clarity and the scale's application time. Cognitive interviewing is a technique used to examine the way the target audience understands, mentally processes, and responds to the presented material, with special emphasis on potential problems in this process, and is very important in scale development, especially for young children (Bell, 2007; Willis, 2004). The child answers the items in the cognitive interview process by thinking aloud. In this process, the researcher carefully listens to the child and questions the reasons for their answers while trying to reveal the expressions that are misunderstood, incomprehensible, and cause confusion (Bell, 2007). Cognitive interviews have brought about important changes in the expressions in the scale; more concrete and more appropriate expressions for daily life have been created. The first stage of the study was planned to include fourth graders, and cognitive interviews were conducted with 4 students from this grade level. However, as some scale items were not sufficiently understood at this grade level, fourth graders were not included in the further implementation processes. The scale's application time was calculated by taking the average of the students who answered the longest and the shortest. The process of creating the item pool is presented in Figure 3.



Figure 3. *Change of Scale Items in the Process*

As a result of cognitive interviews, 6 items were removed from the item pool. The 54-item scale was applied with 497 students studying in the fifth, sixth, and seventh grades of two different secondary schools in the first stage, after obtaining the necessary permissions. Before the application, the students were informed about the research purpose, and it was stated that the data would only be used within the scope of the research. In addition, it was stated to the students that participation in the research was not compulsory, and the research group was made up of voluntary participants. Students were informed about how to complete the scale, and it was stated that the items did not contain a correct or incorrect answer.

After the data collection process, the statistical analyzes of the Historical Thinking Skill Scale (HTSS) were carried out. First of all, the scale's construct validity was examined, and Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were performed. The reliability of

the HTSS was examined using the internal consistency reliability method. SPSS 22 was used for reliability and item analyses with EFA. The AMOS program was used for analyses related to CFA. After the statistical analyzes were completed, the scale was given its final form.

In the scale development studies, it is desirable to perform CFA analysis using a different data set from the EFA data set (Schumacker & Lomax, 2010). Moreover, Orçan (2018) states that once collecting adequate number of samples to perform both EFA and CFA, some of the collected data (for example 50%) may be randomly selected and used for EFA and the other part may be used for CFA, or one of the data sets collected at two different times may be used for the EFA or CFA independently. In this study, the relevant analyzes were conducted using the data set obtained at two independent periods. After the data collection process, the statistical analyzes of the Historical Thinking Skill Scale were carried out. First of all, the scale's construct validity was examined, and Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were performed. The reliability of the HTSS was examined using the internal consistency reliability method. SPSS 22 was used for reliability and item analyses with EFA. The AMOS program was used for analyses related to CFA. After the statistical analyzes were completed, the scale was given its final form.

## Results

In this section, the EFA and CFA processes carried out to examine the construct validity of HTSS are explained.

### Exploratory Factor Analysis (EFA)

Before EFA was performed, attention was paid to the sample size and the relationship between the items to determine whether the data set was suitable for factor analysis (Pallant, 2005). Theoretically, it was concluded that the sample size was sufficient for factor analysis since there were more than 300 participants in the EFA and CFA stages (Tabachnick & Fidell, 2013), and the sample size was more than 5 times the number of items (Ho, 2006). Statistically, a KMO value above .60 is a desired condition for good analysis (Tabachnick & Fidel, 2013). The KMO values in the historical thinking skillset were .84 for detecting time and chronology, .90 for historical inquiry, and .84 for historical empathy. Again, the Bartlett test (Büyüköztürk, 2015), one of the indicators of the sample size, was statistically significant [Time and chronology perception,  $X^2(55, n= 497) = 1181.080, p < .00$ ; Historical inquiry and using evidence,  $X^2(105, n= 497) = 1733,397, p < .00$ ; Historical empathy,  $X^2(55, n= 497) = 939,845, p < .00$ ].

Another critical issue for factor analysis is to reveal the relationship between the items. For this, the oblique rotation technique, which is used when assumed that the measurement tool's factors are related to each other, was used (Seçer, 2015). With reference to EFA results, some items [*Time and chronology perception* (7, 8, 10, 11, 12); *historical inquiry and using evidence* (4, 6, 11, 12, 13, 14, 15, 17, 18, 21, 22); *Historical empathy* (14)] were excluded from the scale due to factor loadings being below .30 (Büyüköztürk, 2015; Pallant, 2005; Seçer, 2015) and not being placed under the factors theoretically appropriately. The factor structures obtained after removing these items from the scale are presented in Table 2.

Table 2. *Factor Loadings of the Items as a Result of EFA*

Time and chronology perception			Historical Inquiry			Historical Empathy					
Item No	Factor 1 (Ck)	Factor 2 (Cs)	Factor 3 (Pcc)	Item No	Factor 1 (Pr)	Factor 2 (Qs)	Factor 3 (Ic)	Item No	Factor 1 (Hc)	Factor 2 (Ae)	Factor 3 (Pt)
TCP3	.819			HI1	.780			HE3	.783		
TCP2	.757			HI2	.707			HE2	.776		
TCP1	.749			HI10	.695			HE9	.664		
TCP5		.806		HI16	.494			HE5	.545		
TCP4		.745		HI5	.474			HE6	.501		
TCP9		.620		HI20	.341			HE8		.775	
TCP6		.589		HI7		.820		HE10		.735	
TCP15			.799	HI3		.682		HE7		.437	
TCP13			.777	HI8		.639		HE12			.84
TCP14			.623	HI9		.413		HE11			.63
TCP16			.443	HI24			.852	HE13			.58
				HI25			.716				
				HI23			.711				
				HI19			.426				
				HI26			.421				

Depending on the contents of the items collected in the factors and the theoretical structure, the factors of the time and chronology perception (TCP) scale in the historical thinking skill scale set emerged in the form of chronology knowledge (Ck), chronology skills (Cs), perception of continuity and change (Ccp) following the original structure. The TCP scale consists of 11 items, the factor loadings of the items vary between .44 and .81, and the factor variance explains 55.57%. For the historical inquiry (HI) scale, a factor distribution suitable for the original 5-factor structure did not occur, and the items were distributed under the factors of planning the research (Pr), questioning the source (Qs), and inference and confirmation (Ic). The factor loadings of 15 items in the HI scale range from .34 to .85, and the factors explain 49.01% of the total variance. For the Historical Empathy (HE) scale, a three-factor structure was obtained as historical contextualization (Hc), affective empathy (Ae), and perspective-taking (Pt), which are also original factors. Three factors in the HE scale explain 52.04% of the variance, and the scale consists of 11 items with factor loadings ranging from .43 to .84.

### Confirmatory Factor Analysis (CFA)

Confirmatory factor analysis (CFA) was conducted with the data of 320 secondary school students (5<sup>th</sup>, 6<sup>th</sup> and 7<sup>th</sup> grades) from two different schools to determine whether the structure created from EFA showed sufficient fit indices and support the construct validity of TDBS. The Chi-Square Fit Test ( $X^2$ ), comparative fit index (CFI), excess fit index (IFI), goodness fit index (GFI), normed fit index (NFI), non-normed fit index (TLI), adjusted goodness fit index (AGFI), tight normed fit index (PNFI), tight goodness fit index (PGFI), standardized root mean square error (SRMR), root mean square of estimation errors (RMSEA) fit indices were examined. Just as there is no definite opinion regarding the criteria to be considered in the fit indices (Weston & Gore, 2006), there is no certainty about which fit indices will be evaluated in the analyses (Karagöz, 2017). CFA results were interpreted by considering the fit index values generally accepted in the literature. The fit indices of the model for each subscale were examined, the  $X^2$  value for TCP ( $X^2= 66.154$ ,  $n=320$ ,  $p=.00$ ); HI ( $X^2= 152.515$ ,  $n=320$ ,  $p=.00$ ); and HE ( $X^2= 79.233$ ,  $n=320$ ,  $p=.00$ ) were significant. The  $X^2$  value is expected to be insignificant in studies, but this value can often be significant in large sample groups. In this respect, the model should have the Chi-square ratio obtained as an alternative divided by the degree of freedom below 2 (Kline, 2016). Acceptable and perfect fit values of the examined fit indices and the values of the subscales are presented in Table 3.

Table 3. Fit Index Values for Fit Indices and Fit Index Values Obtained from CFA

Fit Indices	Perfect Fit	Acceptable Fit	Resource	TCP	HI	HE
$X^2 / df$	$0 \leq \chi^2 / df \leq 2$	$2 < X^2 / df \leq 3$	Schermelele-Engel & Moosbrugger (2003); Kline (2016); Marsh et al, (2006)	1.614	1.753	1.933
AGFI	$.90 \leq AGFI \leq 1.00$	$.85 \leq AGFI \leq .90$		.93*	.90*	.92*
CFI	$.95 \leq CFI \leq 1.00$	$.90 \leq CFI \leq .95$		.94**	.93**	.94**
SRMR	$.00 \leq SRMR \leq .05$	$.05 \leq SRMR \leq .10$		.054**	.048*	.044*
NFI	$.95 \leq NFI \leq 1.00$	$.90 \leq NFI \leq .95$	Marsh et al. (2006) Schumacker & Lomax (2010)	.90**	.92**	.90**
TLI	$.95 \leq TLI \leq 1.00$	$.90 \leq TLI \leq .95$		.92**	.92**	.93**
GFI	$.95 \leq GFI \leq 1.00$	$.90 \leq GFI \leq .95$		.95*	.93**	.95*
IFI	$.95 \leq IFI \leq 1.00$	$.90 \leq IFI \leq .95$		.94**	.93**	.94**
PNFI	$.95 \leq PNFI \leq 1.00$	$.50 \leq PNFI \leq .95$	Meyers, Gamst & Guarino (2006); Karagöz (2017)	.65**	.71**	.67**
PGFI	$.95 \leq PNFI \leq 1.00$	$.50 \leq PNFI \leq .95$		.59**	.67**	.59**
RMSEA	$.00 \leq RMSEA \leq .050$	$.050 \leq RMSEA \leq .080$	Schumacker & Lomax, (2010); Meydan & Şeşen (2015)	.047*	.054**	.058**

\* mean perfect fit; \*\* mean acceptable fit.

The perfect and acceptable fit criteria for fit indices in Table 3 and values obtained from CFA reveal that the three-factor model is compatible for each subscale. The factor loadings of the TCP subscale vary between .46 and .67, .43 and .74 for HI, and .51 and .69 for HE (Figure 4).

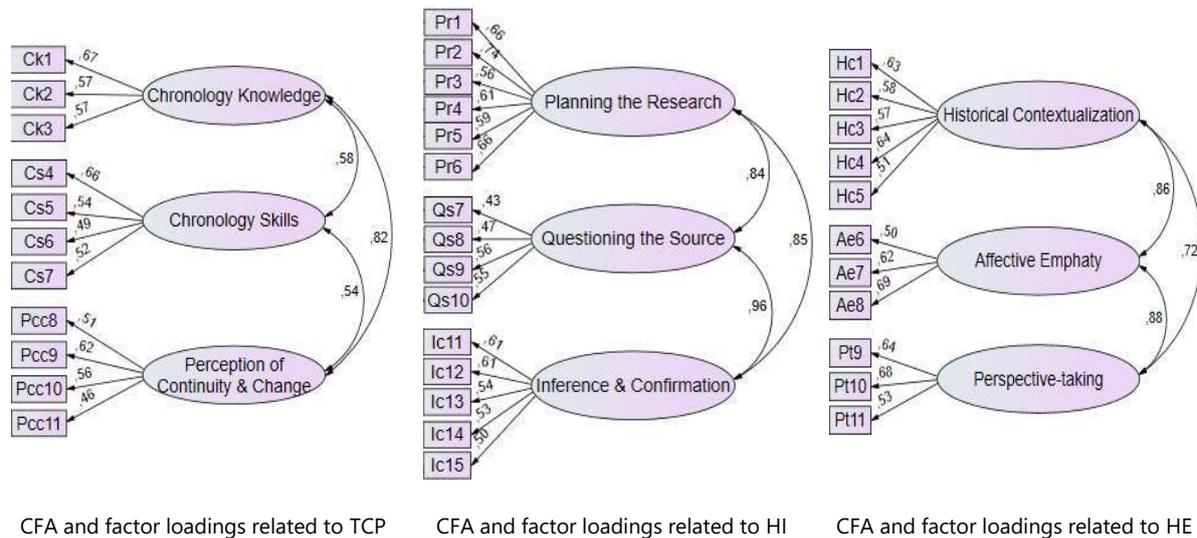


Figure 4. CFA Results of the Historical Thinking Skills Subscales

### Reliability

The reliability of the HTSS was calculated using the internal consistency reliability coefficient. The internal consistency coefficients for TCP were .69 for the Ck sub-dimension, .66 for the Cs sub-dimension, and .65 for the Pcc sub-dimension; .76 for the Pr sub-dimension, .61 for the Qs sub-dimension, and .72 for the Ic sub-dimension of HI; .70 for the Hc sub-dimension, .60 for the Ae sub-dimension, and .60 for the Pt sub-dimension of HE. The overall reliability of the TCP subscale was .79; .86 for HI; and .80 for HE. .70 and above reliability coefficient is desirable (Fraenkel, Wallen & Hyun, 2012; Pallant, 2005). However, since a reliability coefficient of .60 and above in scales with 10 or fewer items is sufficient for the reliability of the measurements (Sipahi, Yurtkoru & Çinko, 2010), the internal consistency reliability coefficients for both the subscales and subscales sub-dimensions of the HTSS are within acceptable limits.

### Evaluation of the HTSS Scores

There are 37 items in HTSS. A 5-point rating was used in the scale: "Strongly Disagree" (1), "Disagree" (2), "Neutral" (3), "Agree" (4), "Strongly Agree" (5). Since all items on the scale are positive, no situation requires reverse scoring. The lowest score that can be obtained from the TCP subscale is 11, and the highest score is 55. The lowest score that can be obtained from the HI subscale is 15, and the highest score is 75. The lowest score that can be obtained from the HE subscale is 11, and the highest score is 55. Although the factor analysis processes are conducted independently of the subscales, since they theoretically constitute the sub-dimension of the same structure, the historical thinking skill score can be obtained by adding the items of all the scales. In such a case, the historical thinking skill score can be calculated as a minimum of 37 and a maximum of 185 points.

## Discussion and Conclusion

This study aimed to develop the historical thinking skillset (HTSS), which will enable students to measure *time and chronology perception, historical inquiry, and historical empathy*, the sub-dimensions of historical thinking skills, validly and reliably. A three-factor structure that explained 55.57% of the total variance of the TCP subscale, 49.01% of the total variance of the HI subscale, and 52.04% of the total variance of the HE subscale was determined. For each scale, the variance explained in the EFA is 30% or more (Büyüköztürk, 2015), the item factor loadings are above .30 (Büyüköztürk, 2015; Pallant, 2005; Seçer, 2015), and the fit indexes are accepted as a result of the CFA analysis. Considering that it is within acceptable limits, it reveals that HTSS can be used as a valid and reliable tool to determine the historical thinking skills of fifth, sixth, and seventh grade students.

In developing the scales, dimensions were first determined within the framework of a theoretical structure. As a result of factor analysis, while the sub-dimensions for TCP and HE remained the same, the five-dimensional structure for HI became three-dimensional. The study used the most inclusive framework based on a study on historical inquiry (Hicks & Doolittle, 2008). Here, the "monitoring" step, which means determining the importance of the sources in the study, coincides with the inference step. Currently, many sources deal with historical inquiry within the framework of researching, planning, using the source, and making inferences (Gutwill & Allen, 2012; Kıcı, 2006). Therefore, historical inquiry has emerged in the scale with its most basic dimensions.

It is suggested that the scales prepared to measure the 3 skills that are the basis of historical thinking skills should be analyzed separately. Although the reliability score of all items (37 items in total) is quite high, it would not be appropriate to calculate a single reliability score for the complete set since the subscales were analyzed separately. However, it is possible to add up the scores obtained from the scales to obtain a single score as a historical thinking skill score and use it in the analysis. The scale can form the basis for different assessment tools for teachers due to its theoretical background and the suitability of the validity and reliability process. While "goal" expressions have turned into "learning outcomes" in the curricula developed in Turkey since 2005, the understanding of alternative evaluation methods have begun to settle (Çobanoğlu & Yıldırım, 2021). Since the scale framework is formed in line with the achievements, it is possible to use it as a readiness scale and convert it into a rubric for observation or material evaluation. However, considering the student's cognitive development, the scale set was suitable for fifth, sixth and seventh grade students. Due to cognitive interviews, it was not suitable for fourth grade students because it included some abstract expressions.

It is a matter of criticism that the acquisitions of history subjects, which were founded with the social studies course and then continued within the scope of the history course at high school, are managed from a very broad framework, and there is uncertainty about how historical thinking skills can be given (Şimşek, 2017). In the same direction, measuring historical thinking skills, a complex thinking skill, is an important problem (Ercikan & Seixas, 2015). In their work that offers a solution to this problem, Ercikan and Seixas (2015) suggest that measuring a thinking skill beyond content knowledge should be taken as a basis for measuring historical thinking skills. In this study, a framework for historical thinking has been proposed beyond the scale development, and an alternative measurement tool aimed at thinking skills

has been presented. The presented framework can be used as a basis for the social studies curriculum framework, or it can also be considered in the curriculum development processes for history courses at further education levels. With new items to be developed following the scale framework, measurement tools can be developed for more advanced classes.

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### **Author Contributions**

The authors contributed equally at all stages of the research.

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## **TÜRKÇE GENİŞ ÖZET**

### **Ortaokul Düzeyinde Tarihsel Düşünme Beceri Ölçeğinin Geliştirilmesi**

#### **Giriş**

Tarihsel düşünme becerisi tarih öğretimi aracılığıyla kazanılan ve öğretim programlarına yön veren en temel becerilerin başında gelir (Demircioğlu, 2009; Keçe, 2015; Seixas, 2017). Tarihsel düşünme "geçmiş anlamak için bağlamı, perspektifi, bakış açısını ve algılanan gerçekleri ortaya koymak da dâhil olmak üzere tarihsel bilgileri kullanma süreci" (Chowen, 2006, p. 11) olarak tanımlansa da tek bir tanımla ifade edilmesi zor bir olgudur. Bu nedenle "tarihsel düşünme" belirli bir tanımdan ziyade genellikle kapsadığı unsurlar veya kazanılması beklenen becerilerle ifade edilmektedir (Seixas & Peck, 2004). Bu çalışmada ulusal ve uluslararası literatürden hareketle tarihsel düşünme becerisinin çerçevesi; zaman ve kronolojiyi algılama, tarihsel sorgulama ve tarihsel empati olarak ele alınmıştır.

Her ne kadar tarihsel düşünme, ileri sınıf düzeylerindeki tarih derslerine özgü bir kazanım gibi görünse de bu düşüncenin yanlış olduğu ve küçük yaşlardan itibaren sistematik biçimde kazandırılabilmesi anlaşılmıştır (Çulha-Özbaş, 2010). Farklı ülkelerde bu becerinin dördüncü sınıftan itibaren kazandırılması gereken bir beceri olarak ifade edildiği görülmektedir (NCHS, 1996). Tarihsel düşünme becerileri pek çok unsuru barındıran karmaşık bir beceri olması nedeniyle değerlendirme yapmak da zorlaşmakta (Ercikan, Seixas, Lyons-Thomas & Gibson, 2015), ölçümü konusunda çok farklı yaklaşımlar gerektirmektedir (Ercikan & Seixas, 2015). Bu nedenle gözlem ve diğer ölçme araçlarını desteklemek üzere öğrenmenin ne ölçüde gerçekleştiğine kanıt oluşturacak araçlara ihtiyaç vardır. Bu doğrultuda, çalışmada özellikle ortaokul düzeyindeki öğrencilerin sahip olması gereken tarihsel düşünme becerileri için bir çerçeve oluşturulurken, bu çerçeveye göre kişisel bildirim dayalı bir ölçek geliştirilmesi amaçlanmıştır. Sunulan çerçeve aynı zamanda farklı ölçme araçları, gözlemler ve hatta program geliştirme süreçleri için de yol gösterici olabilecektir.

#### **Yöntem**

##### **Çalışma Grubu**

Araştırma, 2021-2022 eğitim öğretim yılında ilk aşamada 497 ve ikinci aşamada 320 ortaokul öğrencisi olmak üzere toplam 817 öğrenci ile yürütülmüştür.

##### **Ölçek Geliştirme Süreci**

Tarihsel düşünme beceri ölçek setinin geliştirilme sürecinde DeVellis (2021)'in ölçek geliştirme süreci için önerdiği ilkeler takip edilmiştir. Tarihsel düşünme beceri ölçeği ile ortaokul sosyal bilgiler dersinde tarih konuları ile ilişkili olan Kültür ve Miras Öğrenme Alanı'nda yer alan bilişsel becerilerin ölçülmesi amaçlanmaktadır. Bu bağlamda, ölçek öğrenme alanına ilişkin

olarak zaman ve kronolojiyi algılama, tarihsel sorgulama ve tarihsel empati becerileri kapsamında ortaya çıkarılmıştır.

Tarihsel düşünme beceri ölçek seti için alanyazında yer alan kısıtlı sayıda ölçeklerden (Çalışkan & Demir, 2019), belirlenmiş çerçevelerden (Hicks & Doolittle, 2008; Şimşek, 2006b) hareketle; zaman ve kronolojiyi algılama, tarihsel sorgulama, tarihsel empati olmak üzere üç ayrı alt ölçek için madde havuzu oluşturulmuştur. Madde havuzunda yer alan ifadelerle ilişkin olarak üç sosyal bilgiler eğitimi uzmanının, iki tarih eğitimi uzmanının ve üç sosyal bilgiler öğretmeninin görüşlerine başvurulmuştur. Ölçekte yer alan ifadeler için *Kesinlikle Katılıyorum* (5), *Katılıyorum* (4), *Kararsızım* (3), *Katılmıyorum* (2) ve *Kesinlikle Katılmıyorum* (1) şeklinde beşli likert tipi bir derecelendirme kullanılmıştır. Ölçeğin madde havuzunun oluşturma süreci Şekil 1’te sunulmuştur.



Şekil 1. Ölçek Maddelerinin Süreç İçindeki Değişimi

Sonuçta 54 maddelik ölçeğin uygulaması, gerekli izinler alınarak gerçekleştirilmiştir. Yapı geçerliği için Açıklayıcı Faktör Analizi (AFA) ve Doğrulayıcı Faktör Analizi (DFA) yapılmıştır. TDBÖ'nün güvenilirliği iç tutarlık güvenilirlik yöntemiyle incelenmiştir. Araştırmada AFA ile güvenilirlik ve madde analizleri için SPSS 22, DFA analizleri için AMOS programı kullanılmıştır. Analizler tamamlandıktan sonra ölçeğe son şekli verilmiştir.

## Bulgular

Bu araştırmada, öğrencilerin tarihsel düşünme becerilerinin alt boyutları olan *zaman ve kronolojiyi algılama*, *tarihsel sorgulama* ve *tarihsel empatiyi* geçerli ve güvenilir şekilde ölçmeye imkân verecek tarihsel düşünme beceri ölçek setinin (TDBÖ) geliştirilmesi amaçlanmıştır. TDBÖ'nün; ZKA alt ölçeği için toplam varyansın %55. 57'sini açıklayan; TS alt ölçeği için toplam varyansın %49.01'ini açıklayan; TE alt ölçeği için toplam varyansın %52.04'ünü açıklayan üçer faktörlü bir yapıya sahip oldukları belirlenmiştir. TDBÖ'nün güvenilirliği, iç tutarlılık güvenilirlik katsayısı kullanılarak hesaplanmıştır. İç tutarlılık katsayıları ZKA alt ölçeğinin Kbi alt boyutu için .69, Kbe alt boyutu için .66, Dsa alt boyutu için .65; TS alt ölçeğinin Ap alt boyutu için .76, Ks alt boyutu için .61, Çd alt boyutu için .72; TE alt ölçeğinin Tb alt boyutu için .70, De alt boyutu için .60, Pa alt boyutu için .60 olarak bulunmuştur. Bununla birlikte, ZKA alt ölçeğinin toplam güvenilirliği .79; TS alt ölçeğinin toplam güvenilirliği .86; TE alt ölçeğinin toplam güvenilirliği .80 olarak hesaplanmıştır. Her ölçek için AFA'da açıklanan varyansın %30 ve üzerinde bir değer alması (Büyüköztürk, 2015), madde faktör yüklerinin .30'un üzerinde olması (Büyüköztürk, 2015; Seçer, 2015; Pallant, 2005) ve DFA analizi sonucu uyum indekslerinin kabul edilebilir sınırlar içerisinde [*Tarihsel empati* için minimum  $\chi^2$  değerinin ( $\chi^2= 79.233$ ,  $n=320$ ,  $p=.00$ ); *Tarihsel sorgulama* için ( $\chi^2= 152.515$ ,  $n=320$ ,  $p=.00$ ); Zaman ve kronolojiyi *algılama* için ( $\chi^2= 66.154$ ,  $n=320$ ,  $p=.00$ ); anlamlı olduğu görülmüştür. Uyum indeksi değerleri ise, *Tarihsel empati* için  $X^2/sd= 1.933$ , NFI= .90, TLI= .93, GFI= .95, IFI= .94, AGFI= .92, PNFI= .67, PGFI= .59, CFI= .94, SRMR= .044, RMSEA= .058; *Tarihsel sorgulama* için  $X^2/sd= 1.753$ , NFI= .92, TLI= .92, GFI= .93, IFI= .93, AGFI= .90, PNFI= .71, PGFI= .67, CFI= .93, SRMR= .048, RMSEA= .054; *Zaman ve kronolojiyi algılama* için  $X^2/sd= 1.614$ , NFI= .90, TLI= .92, GFI= .95, IFI= .94, AGFI= .93, PNFI=

.65, PGFI= .59, CFI= .94, SRMR= .054, RMSEA= .047] ve güvenilirlik katsayılarının istenilen düzeyde olması göz önünde bulundurulduğunda TDBÖ'nün beşinci, altıncı ve yedinci sınıf öğrencilerinin tarihsel düşünme becerilerini belirlemek amacıyla geçerli ve güvenilir bir araç olarak kullanılabileceğini ortaya koymaktadır.

### **Tartışma ve Sonuç**

Bu araştırmada, öğrencilerin tarihsel düşünme becerilerinin alt boyutları olan zaman ve kronolojiyi algılama, tarihsel sorgulama ve tarihsel empatiyi geçerli ve güvenilir bir biçimde ölçmeye imkân verecek bir tarihsel düşünme beceri ölçek seti (TDBÖ) geliştirilmiştir. Tarihsel düşünme becerilerinin temeli olan üç beceriyi ölçmek amacıyla hazırlanmış olan bu ölçek setindeki ölçeklerin ayrı ayrı analiz edilmesi önerilse de ölçeklerden elde edilen puanların toplanarak tarihsel düşünme becerisi puanı olarak tek bir puanı elde edilmesi ve analizlerde kullanılması mümkündür. Çalışmada ölçek geliştirmenin ötesinde tarihsel düşünme için bir çerçeve önerisi getirilmiş ve düşünme becerisini hedefleyen alternatif bir ölçme aracı sunulmuştur. Sunulan çerçeve Sosyal Bilgiler dersi öğretim programı çerçevesi için bir temel olarak kullanılabileceği gibi, daha ileri eğitim kademelerinde tarih dersleri için program geliştirme süreçlerinde de göz önüne alınabilir. Ölçeğin çerçevesine uygun şekilde geliştirilecek yeni maddelerle daha ileri düzeydeki sınıflar için ölçme araçları geliştirilebilir. Ölçek gerek teorik alt yapısı gerekse yürütülen geçerlik ve güvenilirlik sürecinin uygunluğu nedeniyle öğretmenler için farklı değerlendirme araçlarına zemin oluşturabilir.

## Appendix

### Historical Thinking Skills Scale

Dear students, this scale aims to measure cognitive achievements in the Social Studies Course. There are 37 items in the scale to measure time and chronology perception, historical inquiry, and historical empathy skills. Read each item and tick the appropriate option from "Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree." Please give honest answers to the questions. Thank you for your contribution and participation.

<b>Time and Chronology Perception</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>
<b>Chronology Knowledge</b>					
1. I can use most time terms correctly (Century, BC, AD, era, prehistory, etc.)					
2. I can use most time expressions correctly (century, generation, millennium, century, etc.)					
3. I can use most temporal concepts correctly (change, chronology, period, etc.)					
<b>Chronology Skills</b>					
4. I can list the periods in which the events took place, even if the dates are not given.					
5. Even if the dates are not given, I can list the periods in which important people lived.					
6. I can place a past event on the timeline.					
7. By looking at the date of an event, I can determine which century it belongs to.					
<b>Perception of Continuity and Change</b>					
8. I am aware that everything around me changes over time.					
9. I know that the outcome of every event in history can cause another event.					
10. I can see the effects of an event that happened in the past on current events.					
11. I think that the solutions to the events in the past can also be solutions to present events.					

<b>Historical Inquiry</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>
Answer the following items by considering how you behave while researching a historical subject using museum artifacts, written works, internet resources, pictures, etc., related to that subject...					
<b>Planning the Research</b>					
1. I know what kind of documents or resources to use when researching a subject related to history.					
2. I know what questions to ask and gather information while researching any subject.					
3. When researching a subject related to history, I look at what information is in the sources (E.g., scientific information, current information, news, etc.)					
4. When researching a subject related to history, I can understand what is said in the source I find.					
5. I can decide whether I have enough resources to complete my research.					
6. I evaluate the information that may be useful for my research in the sources I find.					
<b>Questioning the Source</b>					
7. When researching a subject related to history, I search for the person or institution that prepared the source.					
8. I examine when, how, and where the sources I find were prepared while researching a subject related to history.					
9. While researching a subject related to history, I check whether the source I found is up-to-date.					
10. When examining the information in the historical source, I pay attention to the period in which the source was prepared.					
<b>Inference &amp; Confirmation</b>					
11. I can identify the importance of the resources I find for my research.					
12. I can distinguish similarities and differences in sources.					
13. I think about the reasons for the similarities and differences in the sources.					
14. I can draw different conclusions by looking at the comments in the sources.					

15. I can explain what I have learned from my research, supporting it with historical sources.					
<b>Historical Empathy</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>
<b>Historical Contextualization</b>					
1. I can interpret the causes of historical events in line with the conditions of that period.					
2. I can understand the causes of historical events by examining other events in that period.					
3. I can understand the importance of historical sources and objects in their period.					
4. I can understand the importance of some events in history.					
5. I can interpret the decisions of people who have shaped history key to the conditions of that period.					
<b>Affective Empathy</b>					
6. I can understand the reasons for people's actions in the past.					
7. I can understand the feelings and thoughts of people in the past about the events of that period.					
8. I can understand the feelings and thoughts of people in the past that caused their behavior.					
<b>Perspective-taking</b>					
9. I can predict how people who have shaped history can decide in the face of an event.					
10. I can predict how people who have shaped history will react to an event.					
11. I can understand why important people in history resolved an event in that particular way.					

## Türkçe Versiyon

### Tarihsel Düşünme Becerileri Ölçeği

Değerli öğrenciler, bu ölçek Sosyal Bilgiler Dersi'ndeki bilişsel kazanımların ölçülmesini hedeflemektedir. Ölçekte zaman ve kronolojiyi algılama, tarihsel sorgulama ve tarihsel empati becerilerini ölçmek üzere **37** madde bulunmaktadır. Her bir maddeyi okuyarak "Hiç katılmıyorum, Katılmıyorum, Kararsızım, Katılıyorum, Kesinlikle Katılıyorum" seçeneklerinden size uygun olanı işaretleyiniz. Lütfen sorulara samimi cevaplar veriniz. Katkılarınız ve katılımınız için teşekkür ederiz.

<b>Zaman ve Kronolojiyi Algılama</b>	<b>Hiç katılmıyorum</b>	<b>Katılmıyorum</b>	<b>Kararsızım</b>	<b>Katılıyorum</b>	<b>Kesinlikle Katılıyorum</b>
<b>Kronoloji Bilgisi</b>					
1. Zaman terimlerinin çoğunu doğru kullanabilirim (milat, MÖ, MS, çağ, tarih öncesi, vb.)					
2. Zaman ifadelerinin çoğunu doğru kullanabilirim (yüzyıl, kuşak, milenyum, asır, vb.)					
3. Zamansal kavramlarının çoğunu doğru kullanabilirim (değişim, kronoloji, dönem, vb.)					
<b>Kronoloji Becerileri</b>					
4. Tarihleri verilme bile olayların yaşandığı dönemleri sıralayabilirim.					
5. Tarihleri verilme bile önemli kişilerin yaşadıkları dönemleri sıralayabilirim.					
6. Geçmişteki bir olayı zaman çizelgesine yerleştirebilirim.					
7. Bir olayın tarihine bakarak hangi yüzyıla ait olduğunu belirleyebilirim.					
<b>Değişim ve Sürekliliği Algılama</b>					
8. Çevremdeki her şeyin zaman içerisinde değişime uğradığının farkındayım.					
9. Tarihteki her olayın sonucunun başka bir olaya neden olabileceğini bilirim.					
10. Geçmişte yaşanmış bir olayın bugünkü olaylar üzerindeki etkilerini görebilirim.					
11. Geçmişteki olayların çözümlerinin günümüzdeki olaylarda da çözüm olabileceğini düşünürüm.					

<b>Tarihsel Sorgulama</b>	<b>Hiç katılmıyorum</b>	<b>Katılmıyorum</b>	<b>Kararsızım</b>	<b>Katılıyorum</b>	<b>Kesinlikle Katılıyorum</b>
Aşağıdaki maddeleri, tarihsel bir konuyu araştırırken o konu ile ilişkili müze eserleri, yazılı eserler, internet kaynakları, resimler vb kullanırken nasıl davrandığınızı düşünerek cevaplayınız.					
<b>Araştırmayı Planlama</b>					
1. Tarihle ilgili bir konuyu araştırırken ne tür belge veya kaynakları kullanmam gerektiğini bilirim.					
2. Herhangi bir konuda araştırma yaparken hangi soruları sormam ve bilgileri toplamam gerektiğini bilirim.					
3. Tarihle ilgili bir konuyu araştırırken kaynaklarda ne tür bilgilerin olduğuna göz atarım (Ör. Bilimsel bilgi, güncel bilgi, haber vb)					
4. Tarihle ilgili bir konuyu araştırırken, bulduğum kaynakta neler anlatıldığını anlayabilirim.					
5. Araştırmamı tamamlamak için yeterince kaynağa ulaşım ulaşmadığıma karar verebilirim.					
6. Bulduğum kaynaklarda araştırmam için işe yarayabilecek bilgileri değerlendiririm.					
<b>Kaynağı Sorgulama</b>					
7. Tarihle ilgili bir konuyu araştırırken, kaynağı hazırlayan kişi ya da kurumu araştırırım.					
8. Tarihle ilgili bir konuyu araştırırken bulduğum kaynakların ne zaman, nasıl ve nerede hazırlanmış olduğunu incelerim.					
9. Tarihle ilgili bir konuyu araştırırken bulduğum kaynağın güncel olup olmadığını incelerim.					
10. Tarihsel kaynaktaki bilgileri incelerken kaynağın hazırlandığı döneme dikkat ederim.					
<b>Çıkarım yapma</b>					
11. Bulduğum kaynakların araştırmam için önemini belirleyebilirim.					
12. Kaynaklardaki benzerlik ve farklılıkları ayırt edebilirim.					
13. Kaynaklardaki benzerlik ve farklılıkların nedenleri üzerine düşünürüm.					
14. Kaynaklarda yorumlara bakarak farklı sonuçlar çıkarabilirim.					
15. Araştırmamın sonucundan elde ettiklerimi, tarihsel kaynaklarla destekleyerek açıklayabilirim.					

<b>Tarihsel Empati</b>	<b>Hiç katılmıyorum</b>	<b>Katılmıyorum</b>	<b>Kararsızım</b>	<b>Katılıyorum</b>	<b>Kesinlikle Katılıyorum</b>
<b>Tarihsel bağlamsallaştırma</b>					
1. Tarihi olayların nedenlerini o dönemin şartlarına göre yorumlayabilirim.					
2. Tarihi olayların nedenlerini o dönemdeki diğer olayları inceleyerek anlayabilirim.					
3. Tarihi kaynakların ve nesnelerin ait olduğu dönemdeki önemini anlayabilirim.					
4. Tarihteki bazı olayların önemini anlayabilirim.					
5. Tarihe yön vermiş insanların kararlarını o dönemin şartlarına göre yorumlayabilirim.					
<b>Duyuşsal Empati</b>					
6. Geçmişteki insanların yaptıklarının nedenlerini anlayabilirim.					
7. Geçmişteki insanların o dönemki olaylarla ilgili duygu ve düşüncelerini anlayabilirim.					
8. Geçmiş dönemlerdeki insanların davranışlarına sebep olan duygu ve düşüncelerini anlayabilirim.					
<b>Perspektif Alma</b>					
9. Tarihe yön vermiş insanların bir olay karşısında nasıl bir karar verebileceğini tahmin edebilirim.					
10. Tarihe yön vermiş insanların bir olay karşısında nasıl davranacağını tahmin edebilirim.					
11. Tarihteki önemli kişilerin o dönemdeki olayı neden o şekilde çözdüğünü anlayabilirim.					



## Multicultural Teacher Competencies Scale for Primary Teachers: Development and Implementation Study \*

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### Abstract

In this survey study, it is aimed to develop a valid and reliable scale that can measure multicultural teacher competencies of primary teachers and to examine their multicultural teacher competencies. Three different participant groups were determined by convenience sampling technique. With 336 primary teachers exploratory factor analysis (EFA), with 349 primary teachers confirmatory factor analysis (CFA) was conducted. Then, multicultural teacher competencies of 419 primary teachers in the third group were determined with the scale developed. Data collected through Google forms was analyzed with SPSS 24.0. EFA, CFA, correlation, t-test, Mann Whitney U and Kruskal Wallis tests were carried out in the analysis. As a result of the analysis, consisting of 22 items and three factors; both the overall reliability coefficient, confirmed by CFA, was .94, explaining 62.10% of the total variance and the reliability coefficient values for each factor were calculated as .93 for the first factor, .85 for the second factor and .86 for the third factor. In addition, it was determined that teachers had the most self-efficacy regarding the resilience sub-dimension, followed by their sensitivity to differences and multicultural pedagogical competencies. Multicultural teacher competencies differed significantly in favor of women. There is a significant difference in sensitivity to differences in favor of younger teachers. In the sub-dimension of resilience, it was determined that teachers who work in larger cities had more resilience while there was no significant difference in the context of professional experience.

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## Introduction

Multiculturalism is a very comprehensive phenomenon that includes many concepts such as race, language, gender, disability, social class, religious orientation, ethnicity, sexual orientation and age (Banks & Banks, 2010). Multiculturalism also means that various cultures can live together and that every social group can maintain their existing cultures within the mainstream culture (Bulut & Başbay, 2014). From this point of view, ensuring different cultures' both protecting their own identities and living with others from different cultures in the same environment has turned the concept of multicultural education into a buzz word.

Making a distinction between the concepts of multiculturalism and multicultural education would be beneficial. Multiculturalism is a characteristic of groups and contexts formed by individuals from different origins and characteristics. The term, "multicultural classes" can be an example for this definition. Multicultural education, on the other hand, aims at each student's achieving a high level of success by designing and implementing education programs sensitive to the differences among individuals instead of ignoring them, and is defined as an educational approach that aims at creating a more peaceful society by providing students with values such as equality, justice, democracy, and social action skills (Babayiğit, 2022). On the other hand, Banks (2006) claimed that while the term multiculturalism was defined as a concept preferred by writers who criticized and opposed multicultural education, multicultural education had a multidimensional structure that could be considered as an idea or concept, an educational movement and a process. These three basic dimensions of multicultural education can be explained as follows:

- *Multicultural education as an idea or concept:* Multicultural education is an educational approach that asserts that all students should have equal learning opportunities regardless of language, religion, race, ethnicity, social class or gender. Multicultural education attempts to explain how students are deprived of equal educational opportunities due to their differences as well (Lee and Slaughter-Defoe, 1995; Nieto, 1995).
- *Multicultural education as an education movement:* Multicultural education is a revolutionary movement that is for the innovations that will create equal learning opportunities for all students at schools. It also identifies effective teaching strategies that will enable all students to learn at a high level (Banks, 2006).
- *Multicultural education as a process:* Multicultural education is a never-ending process in a democratic and pluralistic society (Banks, 2006) as one of the main purposes of multicultural education is to ensure the fulfilment of democratic ideals such as justice, equality and freedom in society. However, although these ideals can never be fulfilled comprehensively, individuals are expected to make a constant effort to reach them.

As it can be understood from above, multicultural education is not only an idea, a concept, or education reform movement. In addition, multicultural education is a never-ending process. As a school reform movement emerged from the Civil Rights Movement of the 1960s and 1970s, "multicultural education, once implemented creatively and effectively, has the potential to transform schools to prepare students for the next century" (Banks, 2006, p.88).

The main purpose of multicultural education is to transform all schools, educational institutions and curricula in a way that they would reflect the experiences, backgrounds,

cultures and perspectives of students from various racial, ethnic, religious and social class groups (Esen, 2009). Another main purpose of multicultural education is to provide equality and social justice to all students in a comprehensive, sustainable and more transformative attitude that educators can understand and fulfill it (Gay, 2002). Multicultural education emphasizes diversity rather than uniformity and aims to include all students in the society an equally structured way (Esen, 2009). Thus, boys and girls, exceptional students, and various racial, ethnic, linguistic, and cultural members and groups will have equal chances to succeed academically at school (Banks & Banks, 2010).

Gay (1994) listed the goals of multicultural education as personal development, attitudes and value clarification, multicultural social competence, basic skill proficiency, development of ethnic and cultural literacy, educational equality and excellence, and personal empowerment for social reform. Similarly, Demir (2012) stated the goals of multicultural education as enabling individuals to recognize and respect both their own culture and the different cultures and ethnic differences in the society they live in; developing cultural and ethnic literacy; having the individual know him/herself and developing a positive identity; and raising peaceful individuals. In addition, he stated that the goals of multicultural education included learning how to interact with and understand individuals with different backgrounds, and providing them with different characteristics including mathematical skills, literacy skills, conflict resolution, problem solving and critical thinking skills (Demir, 2012).

In addition to the goals mentioned above, multicultural education aims at increasing academic achievement, eliminating prejudices against cultural differences (Duun, 1997). Besides improving communication among different groups, ensuring pluralism and equality at school, and providing an environment for critical thinking are other important goals of multicultural education (Bohn & Sleeter, 2000). It also includes various goals such as providing individuals with the ability to fight against discrimination and helping them have self-confidence about their identities (Hohensee & Derman-Sparks, 1992).

Undoubtedly, teacher competencies need to be revised in order to put these competencies in to practice. Examining the literature, it could be seen that there are various studies on multicultural teacher competencies (MTC). For example, Banks (1991, cited in Başbay & Kağnıcı, 2011) grouped MTCs under three levels as personal level, class level and school level. The personal level is stated as the teachers' knowing and researching their own culture, evaluating the level of racism and cultural centralism to which they belong, and realizing their own communication skills for multicultural environments. Class level is defined as not regarding minority students as "others", being respectful to all cultures in the school and classroom and creating a suitable classroom environment for this, creating a respectful environment in the classroom, strengthening communication with and among students, and implementing a program that is sensitive to cultural diversity. As for the school level, there are competencies such as policy making for multicultural societies, providing administrative and financial support to multicultural education practices, and creating multicultural environments.

Keengwe (2010), likewise, stated that teachers should accept the existence of different cultures in modern classrooms and provide necessary arrangements for these differences. In addition, teachers are expected to go beyond the theory of cultural mismatch in order for students' languages and cultures to be perceived as equally valuable and powerful, to set high expectations for all students, and to fulfill these expectations. Moreover, teachers are supposed

to understand the cultural diversity represented in the classroom and be prepared for the challenges they will face and be able to learn and apply effective teaching methods that is responsive to the diversity of their students. Particularly, teachers are recommended to be self-reflective about their own prejudices and respect differences and develop a willingness to approach teaching from a multicultural perspective (Keengwe, 2010).

Gay (2002) grouped teacher competencies in multicultural education into three groups. These competencies are awareness in one's own culture and being aware of prejudices, tendency to learn worldviews on different cultures, and development of culturally sensitive teaching methods. Thus, Gay (2002) adopted approaches in multicultural education incorporating experiences of students and cultural backgrounds into teaching practices. In another approach to MTCs, Weinstein, Tomlinson-Clarke & Curran (2004) adopted a five-component approach including teachers' recognition of their own ethnocentrism and prejudices, having knowledge on cultural backgrounds of students, awareness of broader social, economic and political contexts, ability and willingness to use culturally appropriate management strategies, and building compassionate classroom communities. Spiecker and Steutel (2001) stated that today's teachers should have a perception of multiculturalism, be aware that every person has equal rights and should respect this; should be against discrimination, have a democratic attitude, and should be tolerant to different lifestyles.

One of the MTCs classifications based on the literature belongs to Babayiğit (2022). Babayiğit (2022) synthesized the multicultural teacher competencies framework and grouped these competencies under two main titles as egalitarian competencies (EC) and multicultural pedagogical competencies (MPC). This classification is given in Table 1.

From the competencies demonstrated in Table 1, egalitarian competencies are seen to be related to the ability to have the intellectual and affective base required by multicultural education such as respecting differences and being democratic. On the other hand, multicultural pedagogical competencies are related to the competencies of ensuring that all students succeed, regardless of their differences, which is one of the most basic ideals of multicultural education (Babayiğit, 2022).

Table 1. *Multicultural Teacher Competencies Framework (Babayiğit, 2022, p.48)*

Egalitarian Competencies	Being democratic and fair in decisions and processes regarding the classroom and teaching
	Overcoming their own prejudices and accepting cultural diversity along with enabling their students to do the same
	Taking action to change unfair attitudes and practices towards culturally diverse groups and helping students improve social action skills
	Being determined and willing to overcome the difficulties that might stem from the cultural gap between teachers' and students' cultural background
Multicultural Pedagogical Competencies	Exploring the cultural and individual characteristics of students
	Arranging teaching objectives, contents, learning-teaching processes, materials, testing-evaluation methods, and practices in a way that is responsive to cultural backgrounds and learning preferences of students to ensure success for all students

Considering the MTCs in the literature in general, the competencies the teachers should have can be summarized as follows;

- Knowing his/her own culture
- Being willing to understand and learn about different cultures
- Knowing that there may be different cultures in the classroom
- Being able to manage the teaching process by considering different cultures
- Being able to use teaching methods and techniques by considering different cultures
- Being aware of prejudices of students towards different cultures
- Gaining knowledge about cultural backgrounds of students
- Being respectful and tolerant to different cultures
- Demonstrating an embracing attitude towards the students in the minority group
- Standing against discrimination
- Having a democratic attitude
- Having ability to tolerate differences
- Using culture-appropriate management strategies
- Creating a caring classroom environment
- Understanding the cultural differences represented in the classroom and being prepared for the challenges that might appear in advance

Improving the abovementioned multicultural competencies of teachers is crucial in terms of providing high-quality education to all students and building an equitable, peaceful and democratic society. In addition, reliable measurement tools are undoubtedly needed in order to determine where and from which level to start in helping teachers improve these competencies. In this context, it can be said that there are various scales that focus on personality, attitude, experience and competency, belief, knowledge and skill, awareness and sensitivity for multicultural education in the world (Anders, Martin, & Yarbough, 1990; Andrea, Daniels, & Heck, 1991; Guyton & Wesche, 2005; Marshall, 1992; Munroe & Pearson, 2006; Ponterotto, Baluch, Greig & Rivera, 1998; Pope & Mueller, 2000; Reiff & Canella, 1992; Van der Zee, Van Oudenhoven, Ponterotto, & Fietzer, 2012). Some of these scales have been adapted to Turkish context and some other scales have been developed in Turkish context from the scratch. For example, there are scales measuring teachers' attitudes towards multicultural education (Damgacı & Aydın, 2013; Polat, 2012; Yavuz & Anıl, 2010; Yazıcı, Başol, & Toprak, 2008); teacher perceptions (Ayaz, 2016; Başbay & Kağnıcı, 2011), multicultural personalities (Sarıçam, 2014); teachers' sensitivity towards multicultural education (Büyükşahin Çevik, Güzel Yüce & Yavuz, 2016); teachers' knowledge levels of multicultural education (Toraman, Acar, & Aydın, 2015; Yıldırım & Tezci, 2017) and multicultural teacher competencies (Acar-Çiftçi, 2016; Akcaoğlu & Arsal, 2018; Babayiğit, 2022).

A thorough review of the literature revealed that only three measurement tools in the Turkish context focused on measuring teacher competencies. The first scale adapted to Turkish by Akcaoğlu and Arsal (2018) from Guyton and Wesche (2005). Undoubtedly, this scale is regarded to make significant contributions to the literature; however, it is thought to have some deficiencies in terms of cultural sensitivity, since multiculturalism is perceived and interpreted differently in different social contexts. The "Critical Multicultural Education Teacher Competencies Scale" developed by Acar-Çiftçi (2016) seems to have overcome the aforementioned limitation as it was developed in the context of Turkey sample. However, this study, focused only on critical multicultural education theory in its structure. The scale was structured in four dimensions including knowledge, skill, attitude and awareness. The "Multicultural Competence Perceptions Scale" developed by Başbay and Kağnıcı (2011) was

prepared not with teachers but academicians and consisted of awareness, knowledge and skill sub-dimensions. Similarly, Multicultural Teacher Competencies Scale for Teacher Candidates (Babayiğit, 2022) was developed with teacher candidates; therefore, it might not work in other populations.

This study aims at developing a scale to measure the multicultural teacher competencies of primary school teachers, who particularly have a decisive role in the cognitive and affective development of children. Examining the literature, it has been found out that there is no multicultural competency scale developed specifically for primary teachers in Turkey. On the other hand, it was observed that both the developed or adapted scales lacked either egalitarian or multicultural pedagogical competencies. For this reason, the scale to be developed is considered to be an important measurement tool for determining the multicultural professional competencies of primary school teachers, who have an important role in shaping students' perceptions and perspectives. Deriving from this requirement, this study aims at developing a valid and reliable measurement tool that can measure the multicultural teacher competencies of primary school teachers and examining the MTCs of primary school teachers. Answers to the following sub-questions have been sought through the implementation of the developed scale:

1. What are the multicultural teacher competency levels of primary school teachers?
2. Do the multicultural teacher competency levels of primary school teachers differ by gender, age, professional experience and the place where they work?

## Method

### Research Design

In this study, survey model as one of the quantitative research methods was used. In survey type studies, a past or present situation is aimed to be described as it exists. The essential idea of quantitative survey is to measure a group people on the variables of interest and to find out how these variables are related to each other (Punch, 2003).

### Participants

Three different participant groups participated in this study. Explanatory factor analysis (EFA) was done with the data collected from the first group; confirmatory factor analysis (CFA) was done with the data collected from the second group. Finally, the multicultural competencies of the primary school teachers were determined with the data collected from the third group.

#### **EFA participants.**

Convenience sampling technique was used in the determination of the participants. 336 primary school teachers from 40 different cities participated in the study. The provinces that took place the most in the sample were İstanbul, İzmir, Eskişehir, Gaziantep, Sivas and Manisa. Demographic information of the teachers participating in the study is presented in Table 2.

Table 2. *Demographic Information of Primary School Teachers Participating in the EFA Study*

Demographics	Groups	<i>f</i>	%
Gender	Female	241	71.70
	Male	95	28.30
Age	25 and below	17	5.10
	26-40	160	47.60
	41-59	157	46.70
	60 and above	2	6.00
	0-5 years	33	9.80
Professional experience	6-10 years	32	9.50
	11-20 years	162	48.20
	21 years and above	109	32.40
Settlement	Village-town	43	12.80
	County	94	28.00
	City center	199	59.20

Table 2 shows that most of the teachers participated in the study were women ( $n=241$ , 71.70%). Examining the age distribution of the participants in general, it could be seen that most of them were between the ages of 26-59. As for the experience, it could be seen that most of the participants (80.60%) had an experience of 11 years or more. 59.20% of the participants worked in city centers whereas 28% in the counties and 12.80% in the villages and towns, namely rural areas.

### **CFA participants.**

In the confirmatory factor analysis phase of the scale development process, not only primary school teachers but also teachers from 23 different branches participated in the study. Due to the pandemic conditions, since there was not enough data return from the primary school teachers, teachers from different branches were also included in the study in addition to primary teachers. For this purpose, convenient sampling technique was used. At this stage, data were collected from 349 teachers working in 42 different cities, mostly in Eskişehir. Demographic information of the teachers participating in the study is presented in Table 3.

Table 3. *Demographic Information of Teachers Participating in the CFA Study*

Demographics	Groups	<i>f</i>	%
Gender	Female	249	71.30
	Male	100	28.70
Age	25 and below	14	4.00
	26-40	200	57.30
	41-59	135	38.70
	0-5 years	34	9.70
	6-10 years	68	19.50
Professional experience	11-20 years	168	48.10
	21 years and above	79	22.60
	Village-town	54	15.50
Settlement	County	100	28.70
	City center	195	55.90
	Preschool	21	6.00
Education level	Primary School	127	36.40
	Secondary School	141	40.40
	High School	60	17.20

As it can be seen in Table 3, most of the teachers participated in CFA were women ( $n=249$ , 71.70%). Examining the age distribution of the participants, it could be seen that they were generally between the ages of 26-59. As for the experience, it could be seen that most of the participants (70.70%) had an experience of 11 years or more. 55.90% of the participants worked in the province centers whereas 28.70% in the counties and 15.50% in the villages and towns. 6.00% of the participants worked at preschool, 36.40% at primary school, 40.40% at secondary school and 17.20% at high school

### Participants of the Study of Determining the Multicultural Teacher Competencies of Primary School Teachers

After the scale development process was completed, 419 teachers working in different cities were reached in order to find out the multicultural education competencies of primary school teachers. Convenient sampling was used at this stage as well. Demographic information of the teachers participating in the study is presented in Table 4.

Table 4. *Demographic Information of the Teachers Participating in the Study of Determining the Multicultural Teacher Competencies of Primary School Teachers*

Demographics	Groups	<i>f</i>	%
Gender	Female	287	68,50
	Male	132	31,50
Age	25 and below	19	4,50
	26-40	187	44,60
	41-59	211	50,40
	60 and above	2	0,50
Professional experience	0-5 years	36	8,60
	5-9 years	34	8,10
	10-19 years	201	48,00
The city where they work (first 5 provinces)	20 years and above	148	35,30
	Eskişehir	78	18,60
	İstanbul	70	16,70
	Gaziantep	31	7,40
	Denizli	23	5,50
Settlement of work (In terms of settlement unit)	Malatya	21	5,00
	Village-town	69	16,50
	County	117	27,90
	City center	233	55,60

As it is revealed in Table 4, the majority of the teachers participated in the research were female with a rate of 68.50%. As to the rate of male teachers, it was 31.50%. Examining the distribution by age groups, it was seen that 50.40% of the teachers were in the 41-54 age group, which could be expressed as the middle age group. It was followed by a lower age group, young adult teachers (44.60%) aged between 26-44. As it can be seen from the Table 4, 48.00% of primary teachers had a professional experience between 10-19 years. It was followed

by those with 20 years or more experience (35.30%). The teachers participated in the research were found out to work in 45 different provinces, mostly in Eskişehir (18.60%), İstanbul (16.70%), Gaziantep (7.40%), Denizli (5.50%) and Malatya (5.00%). Finally, the settlement where the primary teachers was working was examined and it was found out that the majority of them (55.60%) worked in the city centers. To summarize, the primary school teachers participated in the research were mostly middle-aged women with high professional experiences, working in the city centers mostly in Eskişehir and İstanbul.

### **Scale Development Process**

During the development process of the scale, the scales prepared in the domestic and international literature related to the subject were examined. As a result of the literature review, it was understood that the existing scales mostly measured perceptions and attitudes towards multiculturalism, and the ones measuring competencies were either adaptations of scales developed abroad or not developed for primary school teachers. As a result, it was understood that there were no scales that could measure the multicultural teacher competencies of primary school teachers and a new scale was decided to be developed.

The scale development process including the steps of creating an item pool, determining the scope and face validity, applying it, ensuring construct validity, and calculating the reliability coefficient, were followed in the scale development process (DeVellis, 2017). The scale development process started with the creation of the item pool. First, the existing multicultural classifications and scale items were evaluated by the researchers and an item pool was created in accordance with the research purpose. The initial item pool was pre-examined by the researchers in terms of clarity, explicitness, expression, repetition, and whether it met the purpose or not, and as a result, 88 items were made available for expert opinion. The items in the pool were sent to 13 academicians working in the field of multicultural education or having expertise in curriculum development and two academicians working in the field of assessment and evaluation to get expert opinion for content validity through e-mail. Seven of these experts provided feedback. The evaluations and examinations were reviewed by the researchers; corrections were carried out; and as a result, a 5-Likert type (5-totally agree / 1-strongly disagree) draft scale with 66 items was developed.

### **Data Collection**

The data of this study were collected in three stages from different participant groups. In all of the stages, data were collected respectively through Google forms links. The first stage was carried out between 26.06.2021 and 11.07.2021; the second stage between 26.07.2021 and 11.08.2021; and the third and last stage was carried out between 15.08.2021 and 30.08.2021. The scale, which was reorganized after each of these stages, was shared online through different mediums including social media (such as WhatsApp, Facebook) and teacher groups due to the COVID-19 pandemic, to have it filled by primary school teachers working in various regions of Turkey. 336 primary school teachers from 40 different cities filled in the scale in the

first stage; 349 teachers from 23 different branches in 42 different cities filled in it in the second stage; and 419 primary school teachers from 45 different cities participated in the in the third stage of the study.

### Data Analysis

The data collected from the draft scale were used for exploratory factor analysis (EFA) through the SPSS 24. KMO and Bartlett's test of sphericity results were examined in order to determine whether the data set ready for analysis was suitable for factor analysis. EFA was done after it was found out that the values of the data set were appropriate. In order to test the accuracy of the factors created in the EFA, first-level CFA was carried out through the AMOS Program.

After testing the construct validity of the scale with EFA and CFA, the Cronbach's alpha reliability coefficient was calculated for reliability. For distinctiveness, item correlation values and unrelated samples t-test were performed between 27% lower and upper groups. The relationship between the factors of the scale was tried to be revealed by correlation analysis as well.

In the last stage, non-parametric tests, Mann-Whitney U and Kruskal Wallis, were used in order to examine the multicultural teacher competencies of primary school teachers since the data were not normally distributed.

### Findings

In this section, the findings obtained as a result of the analysis of the collected data are given. The findings are presented under three titles: Findings on the Construct Validity of the Scale, Findings on the Reliability of the Scale, and Findings on the Examination of Multicultural Teacher Competencies of Primary School Teachers.

#### Findings on the Construct Validity of the Scale

For the construct validity of the scale, first EFA and then CFA were applied.

##### Findings on EFA results.

The appropriateness of the data for factor analysis was determined by Kaiser-Meyer Olkin (KMO) sample adequacy measurement and Bartlett's test of sphericity analysis prior to EFA. Results of this analysis were shown in Table 5.

Table 5. *Initial KMO and Bartlett Test Values of the Scale*

<i>Kaiser-Meyer-Olkin Sampling Adequacy Criterion</i>		.93
	Approximate Chi Square	414.579.16
Bartlett's Test of Sphericity	Df	2145
	<i>p</i>	.00

As it can be seen in Table 5, the KMO value of the scale was .93. In addition, the Bartlett sphericity value was significant ( $p < .05$ ), confirming the suitability of the data for factor analysis (Çokluk, Şekercioğlu & Büyüköztürk, 2010; DeVellis, 2017).

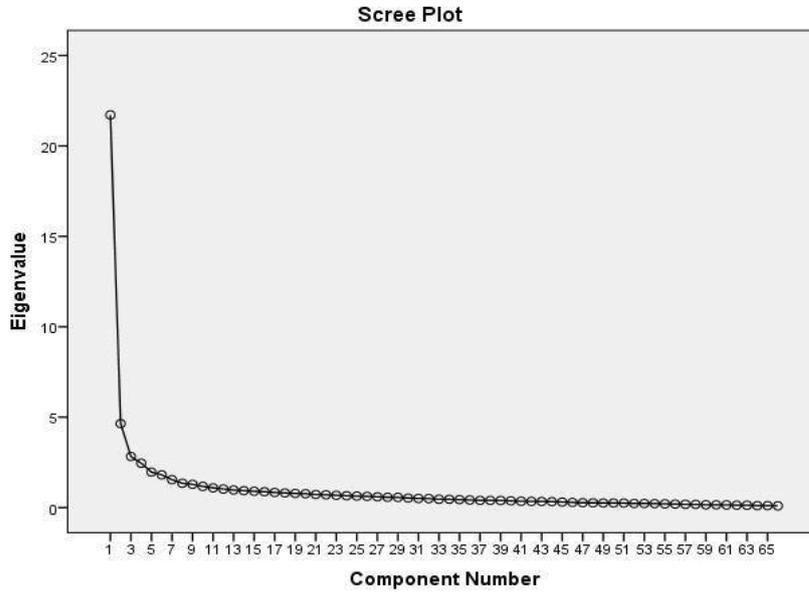


Figure 1. Initial Scree Plot of the Scale

As it can be seen in Figure 1, 3 factors were identified in accordance with the scree plot obtained from the component analysis. Then, the dimensionality of 66 items was examined through principal component factor analysis. The varimax method was used as the rotation method. The initial eigenvalues were examined to determine the factor structure of the scale.

Table 6. Initial-Stage Total Variance Explained and Eigenvalues

Component	Total Variance Explained		
	Total	Initial Eigenvalues	Cumulative %
		% of Variance	
1	21.71	32.90	32.90
2	4.64	7.03	39.93
3	2.82	4.28	44.21
4	2.45	3.71	47.93
5	1.95	2.96	50.89
6	1.80	2.74	53.63
7	1.54	2.33	55.97
8	1.34	2.03	58.00
9	1.28	1.94	59.95
10	1.17	1.77	61.72
11	1.08	1.64	63.37
12	1.02	1.55	64.92
13	.97	1.47	66.39

Extraction Method: Principal Component Analysis.

The initial-stage eigenvalues showed that there were 12 factors which had eigenvalue over 1. However, the 12-factor-structure did not constitute a meaningful structure in terms of theory. Besides, initial scree plot implied that the scale should consist of three factors. Then, the principal component analysis (PCA) was repeated by forcing the test to produce three factors. Table 6 shows the KMO coefficient and Bartlett's test of sphericity results obtained from the second PCA. After forcing PCA to produce three factors, KMO coefficient raised from .93 to .95. The scree plot also showed that the scale had three factors.

Table 7. *KMO and Bartlett Test Values of the Scale*

<i>Kaiser-Meyer-Olkin Sampling Adequacy Criterion</i>		.95
Bartlett's Test of Sphericity	Approximate Chi Square	4847.97
	Df	231
	<i>p</i>	.00

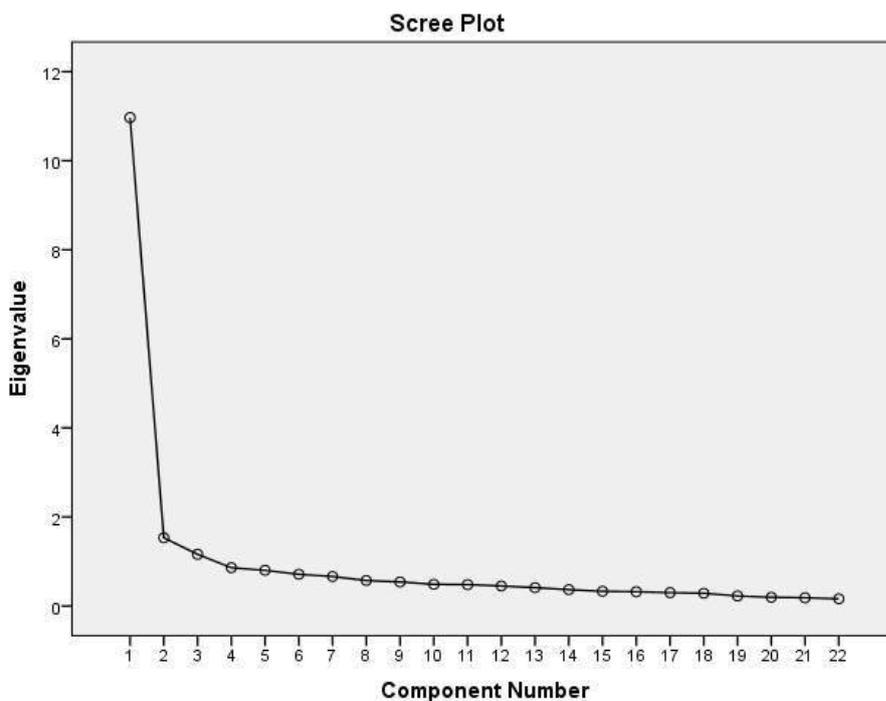


Figure 2. *Scree Plot of the Scale Obtained from the Second PCA*

In the second PCA, the items with a factor load below .3 were directly removed at the stage of removing the items. In addition, the items explaining more than one factor were removed from the scale, and a total of 22 items were included in the analysis (Table 8).

Table 8. *Factor Loads of 22 Items in the Scale*

<i>Factor</i>	<i>Items</i>	<i>Factor loads</i>		
Multicultural pedagogical competencies	Item 1	.81		
	Item 2	.80		
	Item 3	.72		
	Item 4	.70		
	Item 5	.66		
	Item 6	.63		
	Item 7	.57		
	Item 8	.52		
	Item 9	.38		
Sensitivity to differences	Item 10		.68	
	Item 11		.67	
	Item 12		.67	
	Item 13		.65	
	Item 14		.61	
	Item 15		.60	
	Item 16		.58	
	Item 17		.57	
Resilience	Item 18			.75
	Item 19			.70
	Item 20			.70
	Item 21			.69
	Item 22			.67
	Variance %	22.79	20.08	19.22
	Total %	22.79	42.88	62.10

As it can be seen in Table 8, the first factor of the scale consists of 9 items varying between .38 and .81. The second factor consists of 8 items varying between .57 and .68, and the third factor consists of 5 items varying between .67 and .75. Eigenvalues, variance percentages and total variance percentages related to the factors are shown in Table 9.

Table 9. *Structure of Factors in the Scale*

<i>Factor</i>	<i>Eigenvalue</i>	<i>Variance Percentage</i>	<i>Total Variance Percentage</i>
1	5.014	22.79	22.79
2	4.419	20.08	42.88
3	4.229	19.22	62.10

As it can be seen in Table 9, the scale includes three factors with eigenvalues higher than 1. Moreover, these three factors explain 62.10% of the total variance, sufficient to explain the

amount of variance compared to 40%, which is the minimum value accepted in behavioral sciences (Çokluk, Şekercioğlu & Büyüköztürk, 2010).

### Findings on Confirmatory Factor Analysis Process

Confirmatory Factor Analysis was done to test the accuracy of the scale. For this purpose, data were recollected for the scale consisting of 22 items and three dimensions.

In order to test the factor structure of the Multicultural Teacher Competencies Scale (MTCS), confirmatory factor analysis based on the maximum likelihood estimation was used. The factor structure of the scale was tested with a model. In this model, the scale was examined in a three-factor structure as, "Multicultural Pedagogical Competencies, Sensitivity to Differences and Resilience". The model is shown in Figure 2.

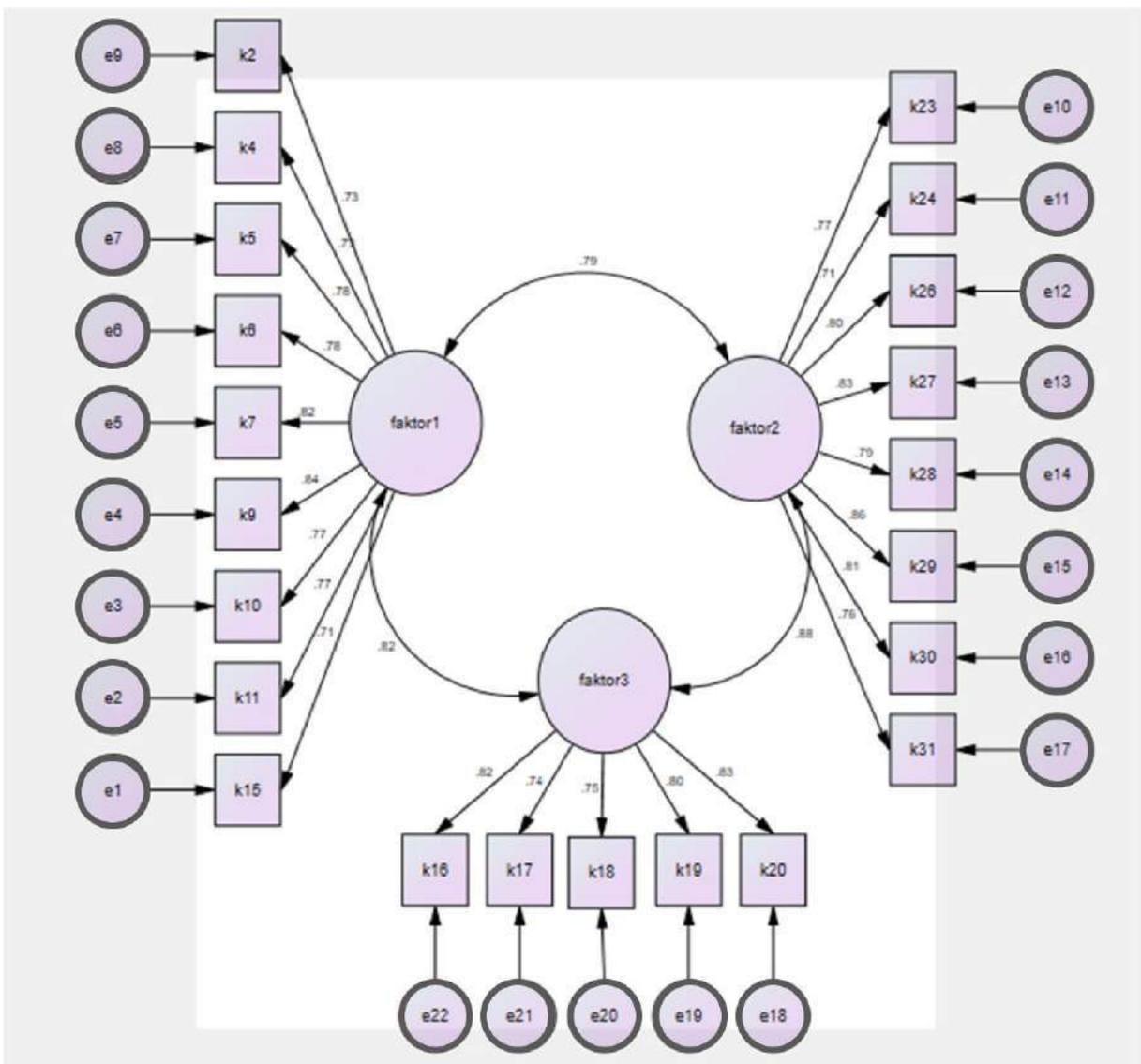


Figure 2. Confirmatory Factor Analysis Results

Acceptability levels for the model were evaluated with model goodness indicators. Model was examined using Chi-square ( $\chi^2$ ), normed Chi-square ( $\chi^2 / df$ , NC), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), comparative index of fit (CFI), root mean square error of approximation (RMSEA) the increasing goodness-of-fit index (IFI) and the normed index of fit (NFI). The model goodness criterion values suggested in the literature are given in Table 10.

Table 10. *Criteria for Model Goodness-of-Fit Indicators*

<i>Model Goodness-of-Fit Indicator</i>	<i>Perfect Fit Criteria</i>	<i>Acceptable Compliance Criteria</i>
RMSEA	$.00 \leq RMSEA \leq .05$	$.05 \leq RMSEA \leq .10$
CFI	$.95 \leq CFI \leq 1.00$	$.90 \leq CFI \leq .95$
IFI	$.95 \leq IFI \leq 1.00$	$.90 \leq IFI \leq .95$
NC	$0 \leq NC \leq 2$	$2 \leq NC \leq 5$
NFI	$.95 \leq NNFI \leq 1.00$	$.90 \leq NNFI \leq .95$
AGFI	$.90 \leq AGFI \leq 1.00$	$.85 \leq AGFI \leq .90$
GFI	$.95 \leq GFI \leq 1.00$	$.90 \leq GFI \leq .95$

In order to minimize the error rate, the RMSEA index, which is also called the square root of the mean squared error in the DFA analysis, was studied on. An RMSEA value less than .05 indicates a perfect fit, a value less than .08 indicates a good fit (Çokluk, Şekercioğlu & Büyüköztürk, 2010), and a value less than .10 indicates an acceptable range (Kline, 2016). NFI, CFI and IFI take values between 0-1, and a value close to 1 indicates perfect fit; .95 a good fit, and over .90 an acceptable value (Bentler & Bonett, 1980; Tabachnick & Fidell, 2007). An AGFI value over .95 indicates perfect fit, and a value over .80 indicates good fit (Çokluk, Şekercioğlu & Büyüköztürk, 2010). A GFI value above .85 and a CFI value above .90 are considered good fit indicators (Çokluk, Şekercioğlu & Büyüköztürk, 2010; Joreskog & Sorbom, 1993; Wang & Wang, 2012). The NC value is a value obtained by dividing the chi-square value by the degrees of freedom. If this value is less than 5, it is considered as an acceptable level (Yılmaz & Çelik, 2009). The CFA results of the scale are presented in Table 11.

Table 11. *CFA Results of the Multicultural Teacher Competencies Scale*

$\chi^2$	<i>df</i>	<i>NC</i>	<i>GFI</i>	<i>AGFI</i>	<i>CFI</i>	<i>RMSEA</i>	<i>IFI</i>	<i>NFI</i>
566.41	206	2.75	.87	.84	.93	.07	.93	.90

Considering the indicators of goodness of fit, it was seen that all values were in the acceptable range in general. However, the GFI value was calculated as .87 and therefore the modifications suggested by the AMOS package program were examined. As a result of the theoretical examination, the realization of these modifications was found to be appropriate, and the analysis was carried out. Thus, modifications were made between the 5th and 6th items and 9th and 10th items in the first factor, and between the 29th and 31st items in the second factor. The results obtained after these modifications are shown in Table 12.

Table 12. *Post-Modification CFA Results of the Multicultural Teacher Competencies Scale*

$\chi^2$	<i>df</i>	<i>NC</i>	<i>GFI</i>	<i>AGFI</i>	<i>CFI</i>	<i>RMSEA</i>	<i>IFI</i>	<i>NFI</i>
425,03	203	2.09	.90	.87	.96	.06	.96	.93

After the modification, the goodness-of-fit indicators, which were determined as criterion values, were found to be between acceptable and excellent levels in general.

### Findings on the Reliability of the Scale

Cronbach's alpha ( $\alpha$ ) coefficient was used to examine the internal consistency reliability of the scale. Accordingly, the reliability coefficient of the scale consisting of 22 items was found to be .94. In addition, the reliability coefficient was calculated for each factor and it was calculated as .93 for the first factor, .85 for the second factor and .86 for the third factor. These results revealed that the scale is a reliable scale (Çokluk, Şekercioğlu & Büyüköztürk, 2010). Table 13 shows the total correlation values of the items for each factor and what the Cronbach's alpha values of the factors would be when the item is removed.

Table 13. *Item Mean, Standard Deviation, Item Total Correlations, and Cronbach's Alpha Coefficient after Item Exclusion*

<i>Items</i>	$\bar{X}$	<i>ss</i>	<i>Item Total Correlation</i>	$\alpha$ after Item Exclusion
<i>Factor 1. Multicultural Pedagogical Competencies</i>				
m37	4.36	.83	.62	.93
m40	4.55	.66	.74	.92
m41	4.42	.85	.77	.92
m42	4.35	.89	.75	.92
m43	4.36	.82	.78	.92
m48	4.52	.69	.77	.92
m49	4.35	.83	.81	.91
m50	4.39	.83	.82	.91
m58	4.38	.834	.63	.93
<i>Factor 2. Sensitivity to Differences</i>				
m9	4.34	.82	.60	.83
m12	4.77	.50	.57	.84
m17	4.44	.79	.60	.83
m19	4.60	.60	.65	.83
m22	4.46	.72	.60	.83
m23	4.65	.60	.63	.83
m25	4.47	.72	.68	.82
m26	4.44	.90	.51	.85
<i>Factor 3. Resilience</i>				
m62	4.58	.62	.74	.82
m63	4.56	.63	.65	.84
m64	4.66	.62	.70	.82
m65	4.36	.93	.60	.87
m66	4.62	.64	.79	.80

Examining Table 13, it can be seen that the item-total correlation values of the scale varied between .82 and .62 in the first factor; between .68 and .51 in the second factor; and between .79 and .60 in the third factor. Considering these values, the scale can be said to have high distinctiveness and internal consistency (Büyüköztürk, 2007). In addition, it was found out that the reliability coefficient did not increase in case of the removal of any item from the scale.

In order to test the measurement power of the scale, the scores of the participants in the data set collected from the whole scale and its sub-dimensions were calculated in order to perform confirmatory factor analysis. The dataset was ranked in an ascending order from the participant with the lowest overall average to the participant with the highest. The scores of the 27% who got the highest scores and the 27% who got the lowest scores were compared using the independent samples t-test. Table 14 shows this comparison.

Table 14. *Comparison of the 27% of Groups with the Highest and Lowest Scores from the Scale*

MTCS	Group	N	$\bar{X}$	Ss	Sd	t	p
Multicultural pedagogical competencies	Low 27%	94	3.64	.57	94.31	22.38	.00*
	High 27%	94	4.98	.04			
Sensitivity to differences	Low 27%	94	3.86	.48	93.51	22.57	.00*
	High 27%	94	4.99	.02			
Resilience	Low 27%	94	3.88	.55	93.99	19.37	.00*
	High 27%	94	4.99	.04			
Overall mean	Low 27%	94	3.77	.46	93.43	25.10	.00*
	High 27%	94	4.98	.02			

\* There is a significant difference in the 95% confidence interval

It is shown in Table 14 that there was a significant difference in the whole scale and in all sub-scales comparing the scores of the highest and lowest 27% groups, and all items of the scale were found out to be distinctive.

Finally, the correlation values between the sub-factors of the scale and the whole scale were examined. Correlation values are shown in Table 15.

Table 15. *Correlation Between the Whole Scale and Its Sub-Factors*

	1st Factor	2nd Factor	3rd Factor	Whole Scale
1. Factor	1	.72	.76	.94
		.00	.00	.00
2. Factor	.72	1	.64	.87
	.00		.00	.00
3. Factor	.76	.64	1	.86
	.00	.00		.00
Whole Scale	.94	.87	.86	1
	.00	.00	.00	
Arithmetic mean	39.71	39.71	39.71	39.71
Standard deviation	5.87	5.87	5.87	5.87

It was found out that there was a positive and significant relationship between all sub-factors and the whole scale ( $r = .64-.94$ ).

### Findings on the Examination of Multicultural Teacher Competencies of Primary School Teachers

After the development process of the Multicultural Teacher Competencies Scale was completed, the implementation process started. In this context, the procedures followed during the development of the scale were re-traced, and the scale was tried to be conveyed to as many different places as possible by means of maximum diversity sampling via Google Forms. The implementation process lasted between 15-30 August 2021. Constant reminders were made to increase the return rate. At the end of this process, a total of 419 teachers working in different provinces were reached. After the scales were controlled, and they were confirmed to be ready for analysis, the data analysis process was carried out using the SPSS program. Frequency, percentage, arithmetic mean, Mann-Whitney U tests were used in the analysis of the research data.

Cronbach's alpha ( $\alpha$ ) coefficient was used to find out the internal consistency reliability of the scale. The reliability coefficient of the scale was found to be .95. The reliability coefficient was also calculated for the sub-dimensions of the scale, and it was calculated as .93 for the first sub-factor, .87 for the second sub-factor and .87 for the third sub-factor.

In order to determine whether the items in the scale showed a normal distribution, skewness and kurtosis values were examined. Provided that these values are between +2 and -2, it is accepted that the data are distributed close to normal (George & Mallery, 2003). When the skewness and kurtosis values of the items of the scale were examined, it was observed that they did not show a normal distribution because they were outside this range and skewness was observed in the histogram curves. For this reason, nonparametric tests were used in the analyzes where the difference was sought. The average scores of primary school teachers in terms of multicultural teacher competency are given in Table 16.

Table 16. Mean Scores of Primary School Teachers on Multicultural Teacher Competencies Scale

<i>Multicultural Teacher Competencies</i>	<i>N</i>	$\bar{X}$	<i>SS</i>
Multicultural Pedagogical Competencies	419	4,38	,66
Sensitivity to Differences	419	4,52	,52
Resilience	419	4,55	,57
Whole Scale	419	4,47	,54

The average scores of the primary school teachers from the scale are shown in Table 16. It was found out that the teachers had the highest competency rate from the resilience sub-dimension ( $\bar{X} = 4.55$ ), followed by sensitivity to differences ( $\bar{X} = 4.52$ ) and multicultural pedagogical competencies ( $\bar{X} = 4.38$ ).

In the following sections, findings regarding whether the multicultural teacher competencies of primary school teachers differed in terms of gender, age, professional experience and the place of employment are presented. Mann-Whitney U test was applied to find out whether the multicultural teacher competencies of the teachers differed in terms of gender (Table 17).

Table 17. Comparison of Multicultural Teacher Competencies by Gender

MTCS	Group	n	Mean rank	Total rank	U	z	p
Multicultural Pedagogical Competencies	Female	287	222.11	63745.50	15466.50	3.06	.00*
	Male	132	183.67	24244.50			
Sensitivity to Differences	Female	287	219.48	63745.50	16222.50	2.40	.00*
	Male	132	189.40	24244.50			
Resilience	Female	287	225.00	62989.50	14636.50	3.91	.01*
	Male	132	177.38	25000.50			
Overall mean	Female	287	222.89	63969.00	15243.00	3.22	.00*
	Male	132	181.98	24021.00			

As seen in Table 17, multicultural teacher competencies of teachers differed significantly by gender ( $U=15243$ ,  $p=.00<.05$ ). Accordingly, multicultural teacher competencies of women were significantly higher than of men. Examining the sub-dimensions of the scale, in terms of multicultural pedagogical competencies ( $U=15466$ ,  $p=.00<.05$ ), sensitivity to differences ( $U=16222$ ,  $p=.00<.05$ ) and resilience ( $U=14636$ ,  $p=.01<.05$ ), a significant difference in favor of women was found as well.

Kruskal Wallis test was applied to find out whether multicultural teacher competencies differed in terms of age. Results of analysis were presented in Table 18.

Table 18. Comparison of Multicultural Teacher Competencies by Age

MTCS	Group	n	Mean rank	Chi-square	p
Multicultural Pedagogical Competencies	25 years and below	19	256.84	3.31	.34
	26-40	187	207.23		
	41-59	211	207.86		
	60 years and above	2	249.50		
Sensitivity to Differences	25 years and below	19	299.34	14.38	.00*
	26-40	187	202.02		
	41-59	211	210.36		
	60 years and above	2	69.50		
Resilience	25 years and below	19	257.24	7.68	.05
	26-40	187	198.03		
	41-59	211	215.24		
	60 years and above	2	327.50		

Table 18. (Cont.)

	25 years and below	19	282.42	7.33	.06
Overall mean	26-40	187	204.51		
	41-59	211	208.54		
	60 years and above	2	189.50		

As seen in Table 18, there was no significant difference in multicultural teacher competencies of teachers ( $\chi^2=7.33$ ,  $p=.06>.05$ ) in terms of age. Although there was no significant age difference in the overall scale, examining the sub-dimensions of the scale, a significant difference was found in sensitivity to differences in terms of age ( $\chi^2=14.38$ ,  $p=.00<.05$ ). Thus, the teachers in the age group of 25 and below can be said to have higher multicultural teacher competencies in terms of sensitivity to differences.

The Kruskal Wallis test was applied to find out whether the multicultural teacher competencies of the teachers differed in terms of professional experience. Test result were given in Table 19.

Table 19. Comparison of Multicultural Teacher Competencies by Professional Experience

MTCS	Group	n	Mean rank	Chi-square	p
Multicultural Pedagogical Competencies	0-5 years	36	215.94	.28	.96
	5-9 years	34	217.90		
	10-19 years	201	208.40		
	20 years and above	148	208.91		
Sensitivity to Differences	0-5 years	36	241.67	5.03	.16
	5-9 years	34	178.24		
	10-19 years	201	210.99		
	20 years and above	148	208.25		
Resilience	0-5 years	36	218.32	4.53	.20
	5-9 years	34	198.72		
	10-19 years	201	199.60		
	20 years and above	148	224.69		
Overall mean	0-5 years	36	229.64	1.39	.70
	5-9 years	34	198.59		
	10-19 years	201	207.18		
	20 years and above	148	211.67		

Table 19 shows no significant difference in multicultural teacher competencies of teachers in terms of their professional experience ( $\chi^2=1.39$ ,  $p=.70>.05$ ).

Table 20 includes the data of comparison of multicultural teacher competencies by the settlements where they work.

Table 20. Comparison of Multicultural Teacher Competencies by the Settlements Where They Work

MTCS	Group	n	Mean rank	Chi-square	p
Multicultural Pedagogical Competencies	Village/town	69	203.64	.94	.62
	County	117	203.67		
	City center	233	215.06		
Sensitivity to Differences	Village/town	69	214.58	.17	.91
	County	117	206.97		
	City center	233	210.17		
Resilience	Village/town	69	176.91	7.87	.02*
	County	117	207.42		
	City center	233	221.09		
Overall mean	Village/town	69	199.32	1.39	.49
	County	117	204.23		
	City center	233	216.06		

As seen in Table 20, there was no significant difference in overall multicultural teacher competencies of the teachers in terms of the place of residence ( $\chi^2=1.39, p=.49>.05$ ). Although there was no significant difference in terms of the place where teachers worked in general, studying on the sub-dimensions of the scale, a significant difference was found in terms of working in the city center in the dimension of resilience ( $\chi^2=7.87, p=.02<.05$ ). Deriving from the findings, it can be said that the bigger the size of the settlement place, the higher the scores of teachers become in the resilience dimension of multicultural professional competencies.

### Discussion, Conclusion and Implications

In this study, a scale consisting of 22 items and three factors was developed to determine the multicultural teacher competencies of primary school teachers. First of all, EFA was applied on the data collected with the scale draft, and 62.14% of the variance was explained with the three factors obtained as a result of the EFA. CFA was applied to test the construct validity of the scale and it was seen that the scale's compliance values were good. In addition, the item-total correlations of the items in the scale were calculated and it was found out that the correlation values of each item were .30 and above. The scale was found out to be distinctive with a 27% lower-upper group comparison. In the correlation analysis performed to determine the relationship between the factors of the scale, it was concluded that there were significant relationships, and it could be used holistically. The total reliability coefficient of the scale was found to be .94. In addition, the reliability coefficient was calculated for each factor individually, and it was calculated as .93 for the first factor; .85 for the second factor; and .86 for the third factor. These results revealed the scale to be a reliable one (Çokluk, Şekercioğlu & Büyüköztürk, 2010; Tabachnick & Fidell, 2007).

The scale developed for primary school teachers was prepared in a 5-point Likert type. It consists of 22 positive items. The Multicultural Teacher Competence Scale consists of three sub-dimensions as mentioned above. There are nine items in the sub-dimension of "multicultural pedagogical competences", which is one of them. Some of these items are, "I prepare activities suitable for the special needs of my students with differences", "I create my content considering individual, cultural and identity differences in the classroom", "I take special precautions to ensure that my students with cultural differences are as successful as others" and so on. In the other sub-dimension of the scale, "sensitivity to differences", there are 8 items. Examples of these items can be given as follows: "I often include group work in order to break down prejudices in the classroom", "I make students with individual, cultural and identity differences feel comfortable in my classroom". The last sub-dimension of the scale is named as "resilience". The total number of items in this sub-dimension is 5, and it includes items such as "I try to overcome the difficulties arising from individual, cultural and identity differences", "I improve myself to be more helpful to my students with individual, cultural and identity differences". In the evaluation of the scale, the total score, the scores of the subscales and the mean scores can be used. A minimum of 22 and a maximum of 110 points can be obtained from the total 22 items in the scale. Minimum 9 and maximum 45 points from the first sub-dimension of the scale can be taken. From the second sub-dimension minimum 8, and maximum 40 points, and from the third sub-dimension, a minimum of 5 and a maximum of 25 points can be taken.

When the factor structure is examined through the lens of theory, it is -expectedly- seen that multicultural pedagogical competencies are at the center of MTCS. What is not expected is the absence of egalitarian competencies. To be able serve well in multicultural classrooms, teachers need to be dedicated to social justice, democracy and have anti-oppressionist attitudes (Babayiğit, 2022; Keengwe, 2010; Spiecker & Steutel, 2001; Villegas & Lucas, 2002; Weinstein et al., 2004). However, during the development of MTCS, many of the items that aimed to measure the egalitarian competencies did not work except for the items related to sensitivity towards differences and resilience. Items expressing egalitarian competencies such as "I do not tolerate discrimination in my classroom" and "I try to create fair education environments" were observed not to come together to form a factor; therefore, they had to be removed from the MTCS. As a result, egalitarian competencies were not included in the scale. This also makes us think that primary school teachers might have felt closer to inclusive education rather than the concepts emphasized by the multicultural education. Therefore, it should be noted that MTCS lacks the items measuring democratic, anti-oppressionist and social justice-oriented attitudes and behaviors. Future researchers who will use MTCS can adopt supplementary measurement tools to make up for this limitation.

As a result of the study, it was found out that the primary teachers had the highest competency in the sub-dimension of resilience and had a lower competency in the sub-dimension of multicultural pedagogical competencies. The reason why teachers got lower

scores on multicultural pedagogical competencies can be explained with teacher training programs in Turkey. Many scholars have emphasized that teacher education programs in Turkey does not prepare teachers to teach in multicultural settings (Babayiğit, 2022; Karataş, 2018; Polat & Kılıç, 2013). Since teachers were not taught the principles and implications of multicultural education, their scores on multicultural pedagogical competencies might have been lower than other factors in MTCS.

Although teachers felt less competent in multicultural pedagogical competencies, the overall arithmetic mean of teachers' scores on MTCS showed that they had a proficiency above the average. Previous quantitative research findings both in teacher population and teacher candidate population are also in line with this result (Bulut & Başbay, 2014; İsmetoğlu, 2017; Karadağ & Özdemir-Özden, 2020). As it was formerly pointed out by Polat and Kılıç (2013), quantitative research results about multicultural education in Turkey depict a more positive picture than the qualitative research results. Therefore, it is recommended for future researchers to dive deeper into this phenomenon by using both qualitative and quantitative methods simultaneously.

In addition, it was found out that there was a significant difference in the multicultural teacher competencies of primary teachers in terms of gender. It was observed that the multicultural teacher competencies of female teachers were higher than the competencies of male teachers. Former studies on the topic yielded controversial findings regarding gender. While some of them reported findings in favor of men (Aslan & Kozikoğlu, 2017; İsmetoğlu, 2017; Karadağ & Özdemir-Özden, 2020), various studies reported higher scores for females especially in terms of attitudes (Başbay et al., 2013; Frazier-Anderson, 2005; Karadağ & Özdemir-Özden, 2020) despite other studies revealing no significant effect of gender (Akın, 2016; Bulut & Başbay, 2014; Marangoz, 2014). The findings of this study support those of Başbay and others (2013), Frazier-Anderson (2005) and Karadağ and Özdemir-Özen (2020); however, more research is needed to clarify the relationship between gender and multicultural competencies.

A significant difference in the multicultural teacher competencies of primary teachers in terms of age in the dimension of sensitivity to differences were found ( $\chi^2=14.38$ ,  $p<0.05$ ). Accordingly, primary school teachers aged 25 and under can be said to have a higher level of multicultural teacher competencies in terms of showing acceptance and tolerance to cultural differences. However, no significant difference in terms of professional experience was determined. In terms of multicultural skills, İsmetoğlu (2017) and Frazier-Anderson (2005) reported that teachers who had less experience in the profession had higher scores. Marangoz (2014), Özdemir and Dil (2013) and Kaya and Söylemez (2014) reported that experience level did not interfere with multicultural competencies and perceptions. Although age and professional experience are very similar variables that can act together, literature presents conflicting findings about them. For example, Aslan and Kozikoğlu (2017) found out that

teachers having higher levels of experience had more positive attitudes about multicultural education while Bulut and Başbay (2014) reported the exact opposite. Unfortunately, the findings of this study are not adequate to answer why these variables act in different ways than similar. Therefore, future researchers are advised to investigate this problem.

There was no significant difference in the multicultural teacher competencies of primary school teachers in terms of the place of residence they worked. However, when the sub-dimensions of the scale were studied on, a significant difference was found in the dimension of resilience for the teachers working in the city center. Accordingly, it can be said that the primary school teachers working in the city centers have more resilience when it comes to solve the problems that stem from the diversity of the students and to make up for the limited resources for learning in the school or environment. In addition, teachers showed less resilience as the settlement got smaller. Teachers working in remote areas might feel helpless and refrain from asking help from colleagues or other sources since there are not enough of them available (Akdağ, 2014). For this reason, it is recommended that more professional support should be provided for teachers who work in smaller settlements and disadvantaged areas. This support can be made available by forming face-to-face teacher groups working in closer areas and by providing online materials, resources and teacher support groups.

In conclusion, a valid and reliable scale called 'Multicultural Teacher Competencies Scale' was developed and used to examine primary teachers' MTC. Having three factors (multicultural pedagogical competencies, sensitivity to differences and resilience), MTCS can be used to measure teachers MTC and can help needs assessment studies required for multicultural teacher training. Although MTCS is a valid and reliable scale, that it can be improved in a way to deepen its content validity with the endeavors of future researchers.

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### **Author Contribution**

The first writer is the project coordinator and has made a contribution to all process. Other writers have made a contribution at an equal rate.

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## **Sınıf Öğretmenlerine Yönelik Çokkültürlü Öğretmen Yeterlikleri Ölçeği: Geliştirme ve Uygulama Çalışması**

### **Giriş**

Bu çalışmada özellikle çocukların bilişsel ve duyuşsal gelişiminde belirleyici role sahip olan sınıf öğretmenlerinin çokkültürlü öğretmen yeterliklerinin belirlenmesi amacıyla bir ölçek geliştirilmesi amaçlanmıştır. Alanyazın incelendiğinde Türkiye bağlamında sınıf öğretmenleri özelinde geliştirilmiş bir çokkültürlü yeterlik ölçeğinin olmadığı belirlenmiştir. Öte yandan, geliştirilen veya uyarlanan ölçeklerde hem eşitlikçi hem de çokkültürlü pedagojik yeterliklere yer verilmediği görülmüştür. Bu nedenle geliştirilecek olan ölçeğin, öğrencilerin algılarının ve bakış açılarının şekillendirilmesinde önemli rolü olan sınıf öğretmenlerinin çokkültürlü öğretmen yeterliklerinin belirlenmesi için önemli bir ölçme aracı olacağı düşünülmektedir. Bu gereksinimden hareketle bu çalışmada temel olarak sınıf öğretmenlerinin çokkültürlü öğretmen yeterliklerini ölçebilecek geçerli ve güvenilir bir ölçme aracı geliştirmek ve sınıf öğretmenlerinin çokkültürlü öğretmen yeterliklerini incelemek amaçlanmıştır. Geliştirilen ölçeğin uygulanması ile de aşağıdaki alt sorulara yanıt aranmıştır:

1. Sınıf öğretmenlerinin çokkültürlü öğretmen yeterlik düzeyleri nedir?
2. Sınıf öğretmenlerinin çokkültürlü öğretmen yeterlik düzeyleri cinsiyete, yaşa, kıdeme ve çalıştıkları yere göre farklılaşmakta mıdır?

### **Yöntem**

Sınıf öğretmenlerinin çokkültürlü öğretmen yeterliklerinin belirlenebilmesi için bir ölçek geliştirilmesi ve geliştirilen bu ölçek ile sınıf öğretmenlerinin çokkültürlü öğretmen yeterliklerinin belirlenmesi amacını taşıyan bu çalışmada nicel araştırma yöntemlerinden tarama modeli kullanılmıştır.

Bu çalışmada üç farklı katılımcı grubu ile çalışılmıştır. Birinci gruptan toplanan veriler ile açımlayıcı faktör analizi (AFA), ikinci gruptan toplanan veriler ile doğrulayıcı faktör analizi (DFA) yapılmış; üçüncü gruptan toplanan veriler ile de sınıf öğretmenlerinin çokkültürlü yeterlikleri belirlenmeye çalışılmıştır. Çalışmanın tüm katılımcılarının belirlenmesinde uygun örnekleme tekniğinden yararlanılmıştır. AFA çalışmasına 40 farklı ilden 336 sınıf öğretmeni katılmıştır. Örneklemde en fazla yer alan iller İstanbul, İzmir, Eskişehir, Gaziantep, Sivas ve Manisa'dır. DFA çalışmasında çoğunluğu Eskişehir olmak üzere 42 farklı ilde çalışan 349 öğretmenden veri

toplanmıştır. Sınıf öğretmenlerinin çokkültürlü eğitim yeterliklerinin belirlenmesi aşamasında da farklı illerde görev yapan 419 öğretmene ulaşılmıştır.

Bu araştırmanın verileri üç aşamada toplanmıştır. Birinci aşamada AFA için, ikinci aşamada DFA için, 3. aşamada da sınıf öğretmenlerinin çokkültürlü öğretmen yeterliklerinin belirlenmesi için farklı katılımcı gruplarından veriler Google Forms aracılığıyla oluşturulan linkler yardımıyla toplanmıştır. Bu aşamaların her birinde yeniden düzenlenen ölçek; Türkiye'nin çeşitli bölgelerinde görev yapmakta olan sınıf öğretmenlerinin doldurmaları amacıyla COVID-19 salgını nedeniyle online olarak sosyal medya ortamları (Whatsapp, Facebook gibi), öğretmen grupları gibi farklı ortamlarda paylaşılmıştır.

Ölçek geliştirme sürecinde madde havuzu oluşturma, kapsam ve görünüş geçerliliğini saptama, uygulama, yapı geçerliliğini sağlama ve güvenilirlik katsayısı hesaplama aşamalarını içeren ölçek geliştirme süreci izlenmiştir. Bu süreçte AFA ve DFA analizleri gerçekleştirilmiştir. Ardından, güvenilirlik için Cronbach alfa güvenilirlik katsayısı hesaplanmıştır. Ayırt edicilik için madde korelasyon değerleri ile %27'lik alt ve üst gruplar arasında ilişkisiz örneklem t testi yapılmıştır. Ölçeğin faktörleri arasındaki ilişki durumu da korelasyon analizi ile ortaya konulmaya çalışılmıştır. Sınıf öğretmenlerinin çokkültürlü öğretmen yeterliklerinin belirlenmesi amacıyla Mann Whitney U ve Kruskal Wallis testlerinden yararlanılmıştır.

### Bulgular

Bu çalışmada sınıf öğretmenlerinin çokkültürlü öğretmen yeterliklerini belirlemek amacıyla 22 maddeden oluşan bir ölçek geliştirilmiştir. Uygulanan AFA çalışması sonucunda ölçeğin üç faktörden oluştuğu ve toplam varyansın %62.10'nu açıkladığı belirlenmiştir. Birinci faktör 9; ikinci faktör 8; üçüncü faktör ise 5 maddeden oluşmuştur. Belirlenen üç faktör ile DFA çalışması gerçekleştirilen ölçeğin uyum iyiliği değerleri incelenmiş ve gerçekleştirilen modifikasyon sonrası uyum iyiliği göstergelerinin ( $df = 203$ ;  $NC=2.09$ ;  $GFI= .90$ ;  $AGFI= .87$ ;  $CFI= .96$ ;  $RMSEA= .06$ ;  $IFI= .96$ ;  $NFI= .93$ ) genel olarak kabul edilebilir düzey ile mükemmel düzey arasında olduğu bulunmuştur.

Geliştirilen Çokkültürlü Öğretmen Yeterlikleri Ölçeği'nin (ÇÖYÖ) iç tutarlılık güvenilirliğini incelemek için Cronbach alfa ( $\alpha$ ) katsayısı kullanılmıştır. Buna göre ölçeğin toplam güvenilirlik katsayısı .94; birinci faktör için .93, ikinci faktör için .85 ve üçüncü faktör için .86 olarak hesaplanmıştır. Bu sonuçlar ölçeğin güvenilir bir ölçek olduğunu ortaya koymuştur (Çokluk vd., 2010). Ölçeğin ölçme gücünün sınanması için %27'lik alt ve üst grup puanları bağımsız örneklem t testi kullanılarak karşılaştırılmıştır. Ölçeğin hem toplam puanında hem de alt boyutlarına ait toplam puanlarda anlamlı farklılık çıkmış ve ölçeğin tüm maddelerinin ayırt edici olduğu belirlenmiştir (1. Faktör  $t= 22.38$ ; 2. Faktör  $t= 22.57$ ; 3. Faktör  $t=19.37$ ; Genel ortalama  $t = 25.10$ ;  $P<0.01$ ). Ölçeğin alt faktörleri ile ölçeğin tümü arasındaki korelasyon değerleri incelendiğinde de tüm alt faktörler ve ölçeğin tümü arasında pozitif yönde anlamlı bir ilişki olduğu belirlenmiştir ( $r= .649-.949$ ).

Sınıf öğretmenlerinin çokkültürlü öğretmen yeterliklerinin belirlenmesi aşamasında öğretmenlerin en fazla yılmazlık alt boyutuna ilişkin ( $\bar{X} = 4.55$ ) özyeterliğe sahip olduğu, bunu farklılıklara duyarlılık ( $\bar{X} = 4.52$ ) yeterlikleri ve çokkültürlü pedagojik yeterliklerin ( $\bar{X} = 4.38$ )

izlediği belirlenmiştir. Çokkültürlü öğretmen yeterliklerinin cinsiyete göre kadınlar lehine anlamlı olarak farklılaştığı ( $U=15243$ ,  $p=,00<,05$ ); öğretmenlerin yaşlarına göre sadece farklılıklara duyarlık alt boyutunda anlamlı farklılık olduğu ( $\chi^2=14,386$ ,  $p<0.05$ ); yılmazlık alt boyutunda da çalışılan ile göre farklılaşmanın olduğu belirlenirken ( $\chi^2=7,870$ ,  $p=.02<.05$ ); mesleki deneyimler bağlamında anlamlı bir farklılık bulunamamıştır ( $\chi^2=1,398$ ,  $p=.70>.05$ ).

### **Tartışma, Sonuç ve Öneriler**

Yapılan tüm analizler sonucunda ölçeğin geçerli ve güvenilir bir ölçme aracı olduğu söylenebilir. Geliştirilen ölçek 5'li Likert türünde hazırlanmış ve 22 olumlu maddeden oluşmuştur. ÇÖYÖ, üç alt boyuttan oluşmaktadır. Bunlardan biri olan "çokkültürlü pedagojik yeterlikler" alt boyutunda 9 madde yer almaktadır. Ölçeğin diğer alt boyutu olan "farklılıklara duyarlılık"ta ise 8 madde yer almaktadır. Ölçeğin son alt boyutu ise "yılmazlık" olarak adlandırılmıştır. Bu alt boyutta toplam madde sayısı 5'tir. Ölçekte yer alan toplam 22 maddeden en az 22, en çok 110 puan alınabilmektedir.

Faktör yapısı teori merceğinden incelendiğinde çokkültürlü pedagojik yeterliklerin ÇÖYÖ'nün merkezinde olduğu görülmektedir. Fakat, çokkültürlü pedagojik yeterliklerin aksine eşitlikçi yeterlikler ÇÖYÖ kapsamında yeterince yer alamamıştır. "Sınıfımda ayrımcılığa tahammül etmem." ve "Adil eğitim ortamları oluşturmaya çalışırım." gibi eşitlikçi yeterlikleri ifade eden maddelerin bir araya gelerek faktör oluşturmadığı görülmüş ve bu nedenle de ölçekten çıkarılmıştır. Bu da sınıf öğretmenlerinin çokkültürlü eğitimin vurguladığı kavramlardan ziyade kapsayıcı eğitime daha yakın hissettiklerini düşündürmektedir. Bu nedenle, ÇÖYÖ'nün demokratik, baskı karşıtı ve sosyal adalet odaklı tutum ve davranışları ölçen maddelerden kısmen yoksun olduğunu belirtmek gerekir. ÇÖYÖ'yü kullanacak olan gelecekteki araştırmacılar, bu sınırlılığın üstesinden gelmek için ek ölçüm araçları kullanabilir.

Öğretmenlerin ÇÖYÖ puanlarının genel aritmetik ortalaması, ortalamanın üzerinde bir yeterliğe sahip olduklarını göstermiştir. Polat ve Kılıç (2013) tarafından daha önce belirtildiği gibi, Türkiye'de çokkültürlü eğitime ilişkin nicel araştırma sonuçları, nitel araştırma sonuçlarından daha olumlu bir tablo ortaya koymaktadır. Bu nedenle, gelecekteki araştırmacıların hem nitel hem de nicel yöntemleri aynı anda kullanarak bu olguyu daha derinlemesine incelemeleri önerilir.

Sınıf öğretmenlerinin çokkültürlü öğretmen yeterliklerinde cinsiyete göre anlamlı bir farklılık olduğu tespit edilmiş, kadınların erkeklerden daha yüksek düzeyde farklılıklara duyarlılık gösterdiği belirlenmiştir. Bu bulgu Başbay ve diğ. (2013), Frazier-Anderson (2005) ve Karadağ ve Özdemir-Özen (2020)'in bulgularıyla örtüşmektedir; ancak cinsiyet ve çokkültürlü yeterlikler arasındaki ilişkiyi netleştirmek için daha fazla araştırmaya ihtiyaç vardır. Ayrıca, 25 yaş ve altındaki sınıf öğretmenlerinin kültürel farklılıkları kabul etme açısından daha yüksek puanlar aldığı görülmüştür. Ancak mesleki deneyim açısından anlamlı bir farklılığa rastlanılamamıştır. Son olarak, il merkezinde görev yapan öğretmenlerin yılmazlık puanlarının daha yüksek olduğu, yerleşim küçüldükçe öğretmenlerin daha az dayanıklılık gösterdikleri belirlenmiştir. Bu nedenle daha küçük yerleşim yerlerinde ve dezavantajlı bölgelerde görev yapan öğretmenlere daha fazla mesleki destek verilmesi önerilmektedir.





## **Examination of the Perceptions of Families with Special Needs Children towards Teachers, School Communication, and Cooperation**

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### **Abstract**

This descriptive survey study investigates the perceptions of families with special needs children regarding the teachers, school communication and cooperation in terms of teachers' sex, age, education, professional formation, and experience. 276 parents whose children benefit from special education services in a special education and rehabilitation center in Sarıyer district of Istanbul province participated to the study. Demographic information form and family-teacher communication and cooperation scale were employed to gather data. Findings revealed that the teacher-school communication and expectations of families with special needs children were quite high. Their perception of cooperating with the teacher was also high, while their participation in "communication and cooperation" was found to be at a medium level. In the study, significant differences were obtained in terms of communication, expectations, and collaborations with teachers' age, gender, occupation, and parents' marital status. Moreover, as the parents' education level increased, their perceptions and opinions regarding school-teacher communication and cooperation demonstrated more positive distribution. It was revealed that parents whose monthly household income was 5000 TL and below had higher and positive views towards family-teacher communication. Lastly, significant and positive relationships were found among parents' family-teacher communication, cooperation, expectations, and participation.

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## Introduction

While defining the educational goals of children with special needs, children cannot be considered alone. Every child is a whole with their family and carries the traces of life provided to them in the family that they grew up in. Family members have extensive knowledge of the child's medical history, daily routines, likes and dislikes, the reasons for their behaviors, and what they need and do not need. Family members are frequently the first to notice the developmental delays and inadequacies of children. The reason is linked to the fact that parents, spend more time with their children than teachers and/or other school staff and observe them more (Smith, 2006). Therefore, it is necessary to consider and care about the thoughts of the families and to establish positive communication in order to make school education beneficial for the child (Cömert & Güleç, 2004). In doing so, families can be integrated into their children's education process. Furthermore, to ensure the continuity of the education implemented in special education, school-family cooperation is vital. Two-way communication should be established and parents and teachers should attempt to comprehend each other's perspectives. No matter how high the quality of the education programs implemented in private education institutions is unless the education is supported by the family, it would not provide permanent behavioral changes in children and achieve the objectives of special education. In this cooperation, it is vital to ensure the participation of both parties (Rodríguez, Blatz, & Elbaum, 2014). Families, school management, and teachers should share the responsibilities required for the healthy development and learning of children (Eliasan & Jenkins, 2003). Effective parent-teacher communication encourages children's learning and helps them to grow and develop through school-family cooperation, which is quite vital (Nuri, 2020). To sum up, teachers who see families as an important stakeholder such as a colleague, cooperate more with parents, which is necessary to ensure effective communication and cooperation (Decker & Decker, 2005; Nuri, Akçamete & Direktör, 2022, Seplocha, 2007).

When the literature is scrutinized, it was noticed that most papers were generally interested in the problems and stress levels of families with children with special needs and their expectations (Haines et al., 2017; Kyzar, Mueller, Grace, & Haines, 2019; Lazerevic & Kopas-Vukašinović, 2014; Mueller & Vick, 2019; Schuh et al., 2015; Shriberg, 2020). Moreover, it was realized that most of the studies in this field were mainly carried out in Anglo-Saxon countries (Baker, Wise, Kelley & Skiba, 2016; Eichin & Volante, 2018; Garbacz, Herman, Thompson & Reinke, 2017; Garbacz, Stormshak, E., Lee, L., & Kost, 2019). However, there are limited studies in Turkey regarding the perspectives of families with special needs children on the teacher, school communication, and cooperation depending on different variables. Hence, in this study, the phenomenon of family-school and family-teacher cooperation in Turkey was investigated through the perspectives of parents of children with special needs, from participatory, holistic, and contextual sides. It is significant to identify the perspectives of these families on the teacher, school communication, and cooperation to raise awareness and inform the school administration, teachers, and other institutions/organizations. Research illustrates that effective private education institutions have high levels of parental and community involvement. This participation can be associated with the learning, development, and behavior of special needs children. Regardless of the family's social or cultural background, family involvement in special education can have a large and multifaceted impact on student learning. For the development

of children, effective communication and cooperation between family and school staff are required. Effective parent-teacher communication helps to support children's learning, positively supports all developmental areas, and helps school-family cooperation grow and improve. Therefore, it is essential to ensure effective communication and cooperation between school and family. One of the most effective ways to make the learning process effective is to integrate families into their children's education (Rodriguez et al., 2014). While family involvement benefits all students, those with special needs often need more parental involvement and support than their peers to get the same level of education as the general student population. Children with special needs often face multifaceted classroom challenges that require the special attention of instructors and the active involvement of their families. Families play a range of supporting roles, including those who can provide educators who may feel under pressure with valuable information about children's special needs. Nonetheless, when families and educators work together, it boosts the probability of children who have special needs have positive and successful learning experiences (Cooc & Bui, 2017). Teachers can realize the education and training program applied at school more easily, reach a healthy result, share responsibilities, reach goals, and increase job satisfaction bythrough the cooperation of school and family (Garbacz, Mcintyre, & Santiago, 2016). Research reveals that parent involvement makes educators more motivated and focused on teaching tasks in class. Moreover, teachers can learn more about students' needs, the ways they can better meet these needs, and the home environment for this purpose by communicating more with parents. Considering this, as the interactions grow, parents of children with special needs often have positive approaches toward teachers, which also boosts the motivation of teachers (Garbacz, et al., 2016; Whyte & Karabon, 2016).

Aforementioned studies conducted in Turkey to reveal their views on parent-school cooperation in formal education (Güleç & Genç, 2010; Güven, 2011; İnal, 2006;). Yet, no study has been found in which parents' opinions towards school-family cooperation in private education institutions with a descriptive approach. It is thought that the findings of the present study will contribute to further school-family cooperation practices in special education. Additionally, focusing on school-family communication and cooperation from a parent perspective will contribute to comprehending the perspectives of parents, who are important stakeholders in teaching/learning processes. Therefore, it is mainly discussed to examine the perceptions of parents of children with special needs towards school-family cooperation in terms of demographic variables and teacher characteristics in the present research. In line with this aim, the following sub-objectives were addressed to obtain answers:

1. What is the level of communication and cooperation perceptions of parents with children with special needs towards teachers?

2. Do the scores obtained from the parent-teacher communication and cooperation scale vary based on the "age, sex, marital status, education level, monthly household income level" and the age of the teacher of the parents of children with special needs?

## **Method**

### **Research Design**

The descriptive survey method, which is under the quantitative research methods, was used to examine the perceptions and thoughts of the parent of children with special needs on

family-teacher communication and cooperation. Descriptive survey research design leads to answers to the questions of “who, what, when, where, and how” relevant to a particular research problem. This research model cannot definitively determine the answers to why questions. The descriptive survey method is utilized for gathering data regarding the present state of a phenomenon and for defining “existing” based on the variables or conditions in a certain situation (Özmen & Karamustafaoğlu, 2019).

### Population and Participants

An online data collection procedure through Google Forms was performed on parents with children with special needs who were studying at a special education and rehabilitation center in the Sarıyer district of Istanbul. The convenience sampling method, among purposeful sampling methods, was used in the present study. In this approach, as the name suggests, elements of the research group are selected solely based on suitability in terms of relevance, access, and accessibility, by the purpose of the study. The instance is created quickly without putting any overhead on existing resources. In this approach, in many cases, it is essential to describe the intended information in a versatile and in-depth manner rather than generalizing it to the general population. The aforementioned technique is frequently utilized in preliminary research practice to get a gross estimate of outcomes regardless of incurring the cost or time necessary to randomly choose a population (Özmen & Karamustafaoğlu, 2019). In this regard, the measurement tools of the research were implemented for 274 parents who accepted voluntary participation in the study based on the convenience sampling method. The demographic distribution of the characteristics of children with special needs in the research group is presented in Table 1 in detail.

Table 1. *Distribution of parents by socio-demographic characteristics (N=274)*

	Number (n)	Percentage (%)
<i>Age</i>		
20-29	53	19,2
30-39	96	34,78
40-49	97	35,14
50≥	30	10,87
<i>Gender</i>		
Female	219	79,35
Male	57	20,65
<i>Marital Status</i>		
Married	212	76,81
Single	64	23,19
<i>Education</i>		
Primary School	27	9,78
Middle School	30	10,87
High School	106	38,41
Bachelor and above	113	40,94
<i>Monthly Household Income</i>		
3000 TL and below	111	40,22
3001-5000 TL	92	33,33
5001-7000 TL	42	15,22
7001 TL and above	31	11,23

*Table 1. (Cont.)*

<i>Age of Children's Teacher</i>		
20-29	69	25
30-39	166	60,14
40≥	41	14,86

Table one illustrates that the 19.20% of the parents participating in the study were 20-29 years old, 34.78% were 30-39 years old, 35.14% were 40-49 years old, and 10.87% were 50 years old and over. It was determined that 79.35% were female, 20.35% were male, 76.81% were married and 23.19% were single. It was revealed that 9.78% of the parents had primary school, 10.87% had secondary school, 38.41% had high school and 40.94% had undergraduate or higher education. The monthly household income of 40.22% of the parents included in the research was 3000 TL or less, 33.33% of them were between 3001-5000 TL, 15.22% of them were between 5001-7000 TL and 11.23% of them were 7001 TL and above. When the distribution of parents based on the age of their children's teachers was examined, it was revealed that 25.0% of their children's teachers were between 20-29 years old, 60.14% of them were 30-39 years old, and 14.86% of them were 40 years old and over.

## **Data Collection Tools**

### **Demographic Information Form**

In this part of the measurement tool, questions regarding the distribution of parents based on their socio-demographic characteristics were included. In this context, the questions of gender, age, marital status, educational status, household income and the age of the child's teacher were covered.

### **Family-Teacher Communication and Cooperation Scale**

In the present study, the "Family-Teacher Communication and Cooperation Scale", which was developed by Atabey and Tezelşahin (2011), was utilized to measure the perceptions and thoughts of parents who have children with special needs. In light of this, mentioned scale assisted the researchers in further evaluating the interaction and cooperation among parents, schools, and educators. The scale includes 4 sub-dimensions, namely communication, expectation, cooperation, and family involvement, and a total of 62 questions. The questions in both scales are "5-point Likert" type and the options are; "strongly disagree" (1), "disagree" (2), "undecided" (3), "agree" (4), and "strongly agree" (5). This scale consists of Communication (12 items), Expectation (7 items), Cooperation (21 items), and Family Participation (22 items). Atabey and Tezel-Şahin (2011) conducted an analysis to test the construct validity of the scale. The factor and item analyses of the subscale and the whole scale performed on the measurement tool demonstrate that the participants, consisting of parents of children with special needs, have a construct validity suitable for measuring their perceptions of family-teacher communication and cooperation.

The Cronbach Alpha coefficient was utilized to examine the reliability level of the parent-teacher communication and cooperation scale on parents of children with special needs related to internal consistency. The fact that the alpha coefficient is 0.70 and higher indicates that the reliability of the scale is sufficient (Yurt & Sünbül, 2014). In the study group consisting of

parents of children with special needs, Cronbach's alpha coefficients for the "Family-Teacher Communication and Cooperation Scale" were calculated as 0.92, 0.74, 0.92, and 0.93, respectively. The Cronbach's alpha coefficient for the whole scale is 0.95. The coefficients obtained showed that the reliability of the scales due to internal consistency was at a high level.

### Data Collection

Descriptive statistics were obtained within the scope of the research with arithmetic mean and standard deviation. Normal distribution analyzes were performed with the "Kolmogorov Smirnov Test" on the scores of parents of children with special needs from the "Teacher Communication and Cooperation Scale". Kolmogorov Smirnov Test" results revealed that the "Teacher Communication and Cooperation Scale" scores of parents of children with special needs did not meet the normal distribution assumption. In this case, non-parametric statistical techniques called "Mann Whitney U Test" (gender, marital status) and "Kruskal Wallis Test" (age, education level, monthly household income, age of the child's teacher) were applied. Significance level ( $p=0.05$ ) was taken and statistical significance  $p<0.05$  level was sought.

### Results

In this section, the findings obtained from the research are included.

Table 2. Scores of Parents from the Family-Teacher Communication and Cooperation Scale (N=276)

<i>Family-Teacher Communication and Cooperation Scale Sub-dimensions</i>	<i>N</i>	<i><math>\bar{x}</math></i>	<i>SS</i>	<i>Min</i>	<i>Max</i>
<i>Communication</i>	276	54,90	7,93	12	60
<i>Expectation</i>	276	31,08	5,53	12	35
<i>Cooperation</i>	276	84,61	18,47	23	105
<i>Family Participation</i>	276	80,47	21,41	22	110
<i>Family-Teacher Communication and Cooperation Scale</i>	276	251,06	47,21	73	310

In Table 2, some descriptive statistics are presented regarding the scores of parents included in the study from the "Family-Teacher Communication and Cooperation Scale". When Table 2. is considered, an average of  $54.90 \pm 7.93$  points from the communication sub-dimension of the "Parents-Teacher Communication and Cooperation Scale", an average of  $31.08 \pm 5.53$  points from the expectation sub-dimension, and an average of  $84.61 \pm 18.47$  from the cooperation sub-dimension score and family involvement sub-dimension, they scored an average of  $80.47 \pm 21.41$  points. While the parents included in the study received an average of  $251.06 \pm 47.21$  points from the "Family-Teacher Communication and Cooperation Scale", the lowest score they got from the "Family-Teacher Communication and Cooperation Scale" was 73 and the highest score was 310.

Table 3. Comparison of Parents' Scores from the Family-Teacher Communication and Cooperation Scale by Age Groups (N=276).

	Age	N	$\bar{x}$	SS	M	SO	$\chi^2$	p	Difference
Communication	20-29	53	52,42	9,36	55,00	114,72	17,435	0,001*	1-2
	30-39	96	57,20	5,41	60,00	161,77			2-4
	40-49	97	54,35	8,28	60,00	134,70			
	50≥	30	53,70	9,21	56,00	118,33			
Expectation	20-29	53	29,21	6,31	29,00	113,77	27,787	0,000*	1-2
	30-39	96	32,99	3,99	35,00	168,28			2-4
	40-49	97	30,66	5,94	34,00	132,62			
	50>	30	29,63	5,36	30,00	105,90			
Cooperation	20-29	53	80,30	17,66	79,00	118,87	11,889	0,008*	1-2
	30-39	96	89,51	15,97	94,50	158,93			2-4
	40-49	97	83,47	19,88	85,00	135,58			
	50>	30	80,20	19,84	76,00	117,23			
Family Participation	20-29	53	81,72	20,75	83,00	142,70	3,186	0,364	
	30-39	96	82,53	19,55	84,50	144,74			
	40-49	97	79,88	22,47	82,00	137,03			
	50>	30	73,60	24,16	74,00	115,87			
Family-Teacher Communication and Cooperation Scale	20-29	53	243,64	47,92	243,00	125,79	8,338	0,040*	1-2
	30-39	96	262,23	39,12	269,00	155,76			2-4
	40-49	97	248,36	50,24	254,00	135,24			
	50>	30	237,13	53,91	225,00	116,27			

\*p&lt;0,05

Table 3 illustrates the "Kruskal-Wallis H test" results regarding the contrast of parents' marks through the "Family-Teacher Communication and Cooperation Scale" according to their age groups. When Table 3 is considered, it was revealed that the distinction among the marks of families in the scale in general and in the communication, expectation and cooperation sub-dimensions in the scale according to age groups was statistically significant ( $p<0.05$ ). Points obtained from the parents in the 30-39 age group from the "Teacher Communication and Cooperation Scale" in general and the communication, expectation, and cooperation sub-dimensions of the scale were noticed to be higher than the parents in the 20-29 age group and 50 and over age group. A statistically significant distinction among parents' points participating in the study from the parent involvement sub-dimension in the "Teacher Communication and Cooperation Scale" was based on age ( $p<0.05$ ).

Table 4. Comparison of Parents' Scores from the Family-Teacher Communication and Cooperation Scale by Gender (N=276)

	Gender	n	$\bar{x}$	SS	M	SO	Z	p
Communication	Female	219	55,37	8,05	60,00	145,28	-2,980	0,003*
	Male	57	53,11	7,23	55,00	112,46		
Expectation	Female	219	31,42	5,61	35,00	144,79	-2,764	0,006*
	Male	57	29,79	5,05	30,00	114,32		
Cooperation	Female	219	85,95	18,75	91,00	145,12	-2,715	0,007*
	Male	57	79,47	16,49	76,00	113,07		
Family Participation	Female	219	81,62	22,11	85,00	143,87	-2,193	0,028*
	Male	57	76,07	17,97	77,00	117,87		

Table 4. (Cont.)

<i>Family-Teacher Communication and Cooperation Scale</i>	Female	219	254,34	48,47	267,00	145,84		
	Male	57	238,44	39,92	234,00	110,28	-2,999	0,003*

\*p&lt;0,05

Table 4 illustrates outcomes given by the Mann-Whitney U test due to comparing the marks they got from the Family-Teacher Communication and Cooperation Scale based on the parents' gender participating in the research. When Table 4 is examined, results demonstrated that there is a statistically important distinction among the points of the Parent-Teacher Communication and Cooperation Scale in general and the communication, expectation, cooperation, and family participation sub-dimensions in the scale based on sex ( $p < 0.05$ ). Also, the scores of the female parents in the Family-Teacher Communication and Cooperation Scale in general and in the communication, expectation, cooperation, and family participation sub-dimensions of the scale were significantly higher than the male parents.

Table 5. Comparison of Parents' Scores from the Family-Teacher Communication and Cooperation Scale by Marital Status (N=276)

	<i>Marital Status</i>	<i>N</i>	$\bar{x}$	<i>SS</i>	<i>M</i>	<i>SO</i>	<i>Z</i>	<i>p</i>
<i>Communication</i>	Married	212	55,52	7,77	60,00	145,59	-2,897	0,004*
	Single	64	52,84	8,17	57,50	115,00		
<i>Expectation</i>	Married	212	31,50	5,37	35,00	143,81	-2,164	0,030*
	Single	64	29,69	5,88	33,00	120,92		
<i>Cooperation</i>	Married	212	85,31	18,72	88,50	142,27	-1,437	0,151
	Single	64	82,28	17,56	80,50	126,01		
<i>Family Participation</i>	Married	212	80,04	22,10	83,00	137,33	-0,442	0,659
	Single	64	81,91	19,05	82,00	142,36		
<i>Family-Teacher Communication and Cooperation Scale</i>	Married	212	252,37	47,72	261,50	141,20	-1,023	0,306
	Single	64	246,72	45,54	245,00	129,56		

\*p&lt;0,05

In Table 5, the scores obtained from the Family-Teacher Communication and Cooperation Scale based on the marital status of families were compared with the Mann-Whitney U test. When Table 5 is examined, outcomes confirmed that there is a statistically important distinction among the marks of the parents in the communication and expectation sub-dimensions of the Family-Teacher Communication and Cooperation Scale based on the families' marital status ( $p < 0.05$ ). The scores of the married parents in the communication and expectation sub-dimensions in the Family-Teacher Communication and Cooperation Scale are higher than the singles. As revealed, no statistically significant distinction between the scores of the Parent-Teacher Communication and Cooperation Scale in general and the cooperation and family participation sub-dimensions in the scale according to the marital status of the parents ( $p > 0.05$ ). Married and single parents got similar scores from the Teacher Communication and Collaboration Scale in general and the cooperation and family involvement sub-dimensions in the scale.

Table 6. Comparison of Parents' Scores from the Family-Teacher Communication and Cooperation Scale by Education Level (N=276)

	Education	N	$\bar{x}$	SS	M	SO	$\chi^2$	p	Difference
Communication	Primary School	27	57,11	9,53	60,00	173,33	25,463	0,000*	1-4
	Middle School	30	58,87	2,61	60,00	181,67			2-4
	High School	106	55,03	7,69	60,00	139,99			
	Bachelor and above	113	53,19	8,23	57,00	117,32			
Expectation	Primary School	27	33,85	4,57	35,00	190,06	33,903	0,000*	1-4
	Middle School	30	34,27	1,76	35,00	182,27			2-4
	High School	106	30,82	6,03	35,00	136,91			
	Bachelor and above	113	29,81	5,40	30,00	116,06			
Cooperation	Primary School	27	94,74	16,51	101,00	188,57	17,254	0,001*	1-3
	Middle School	30	90,93	16,18	98,00	164,47			1-4
	High School	106	82,09	19,31	83,00	128,37			2-3
	Bachelor and above	113	82,87	17,67	82,00	129,15			3-4
Family Participation	Primary School	27	90,26	22,54	101,00	179,11	11,593	0,009*	1-3
	Middle School	30	84,33	20,54	88,50	152,22			1-4
	High School	106	76,47	22,16	77,50	123,62			2-3
	Bachelor and above	113	80,86	19,89	83,00	139,11			3-4
Family-Teacher Communication and Cooperation Scale	Primary School	27	275,96	48,19	291,00	190,35	18,712	0,000*	1-3
	Middle School	30	268,40	37,25	278,00	166,48			1-4
	High School	106	244,42	49,42	247,00	128,10			2-3
	Bachelor and above	113	246,73	44,64	246,00	128,43			2-4

\* $p < 0,05$ 

Table 6 shows the "Kruskal-Wallis H test" outcomes, which are preferred to contrast the parents' points from the "Family-Teacher Communication and Cooperation Scale" depending on their educational status. Table 6 revealed that there is a statistically significant difference between the scores of the "Parent-Teacher Communication and Cooperation Scale" in general and the communication, expectation, cooperation, and family participation sub-dimensions in the scale depending on the educational status of the parents ( $p < 0.05$ ). The scores of the parents who graduated from secondary school and secondary school in the whole of the scale and the sub-dimensions of communication, expectation, cooperation, and family participation in the scale were significantly lower than the parents who had an undergraduate or higher

education level. Additionally, the scores of the parents who graduated from primary and secondary school in the "Teacher Communication and Cooperation Scale" in general and in the cooperation and family participation sub-dimensions in the scale were elicited to be lower than the parents who graduated from high school.

Table 7. Comparison of Parents' Scores from the Family-Teacher Communication and Cooperation Scale by Monthly Household Income (N=276)

	Monthly Household Income	N	$\bar{x}$	SS	M	SO	$\chi^2$	P	Diff.
Communication	3000 TL and below	111	55,91	7,65	60,00	148,41	15,903	0,001*	1-3
	3001-5000 TL	92	55,49	8,14	60,00	150,03			1-4
	5001-7000 TL	42	52,74	7,53	54,00	107,89			2-3
	7001 TL and above	31	52,45	8,07	54,00	110,27			2-4
Expectation	3000 TL and below	111	31,52	5,93	35,00	149,36	14,837	0,002*	1-3
	3001-5000 TL	92	31,76	5,04	35,00	147,99			1-4
	5001-7000 TL	42	29,64	5,19	31,00	106,86			2-3
	7001 TL and above	31	29,42	5,49	30,00	114,31			2-4
Cooperation	3000 TL and below	111	85,48	20,05	91,00	145,52	2,862	0,413	
	3001-5000 TL	92	84,93	18,35	85,50	139,77			
	5001-7000 TL	42	83,57	16,49	83,00	130,00			
	7001 TL and above	31	81,94	15,76	81,00	121,11			
Family Participation	3000 TL and below	111	80,37	22,81	85,00	140,04	1,396	0,706	
	3001-5000 TL	92	82,24	20,07	83,00	143,43			
	5001-7000 TL	42	78,57	23,90	81,00	133,18			
	7001 TL and above	31	78,16	16,49	77,00	125,56			
Family-Teacher Communication and Cooperation Scale	3000 TL and below	111	253,28	50,07	267,00	144,63	4,869	0,182	
	3001-5000 TL	92	254,42	45,76	254,50	144,78			
	5001-7000 TL	42	244,52	47,50	232,50	125,18			
	7001 TL and above	31	241,97	40,03	240,00	115,98			

\*p<0,05

As shown in Table 7, the scores of the parents from the "Family-Teacher Communication and Cooperation Scale" according to the monthly household income were compared by utilizing the "Kruskal-Wallis H test". Table 7 proves that there is a statistically important distinction among the scores of the families in the communication and expectation sub-dimensions in the "Family-Teacher Communication and Cooperation Scale" according to the monthly household income ( $p < 0.05$ ). Parents with a monthly household income of 3000 TL or less and 3001-5000 TL have higher scores from the communication and expectation sub-dimensions in the scale than those with a monthly household income of 5001-7000 TL and 7001 TL and above. Also, it was noticed that no statistically important distinction among the marks of the families from the mentioned scale in general and the cooperation and family participation sub-dimensions in the scale according to the monthly household income ( $p > 0.05$ ). Regardless of their monthly household income, the parents included in the study received similar scores from the "Teacher Communication and Cooperation Scale" in general and the cooperation and family participation sub-dimensions in the scale.

Table 8. Comparison of Parents' Scores from the Parent-Teacher Communication and Cooperation Scale according to the Age of the Child's Teacher (N=276)

	Age of the Child's Teacher	N	$\bar{x}$	SS	M	SO	$\chi^2$	p	Diff.
Communication	20-29	69	54,61	8,57	59,00	132,25	12,573	0,002*	1-3
	30-39	166	55,64	7,41	60,00	149,41			2-3
	40≥	41	52,39	8,48	54,00	104,84			
Expectation	20-29	69	30,83	5,74	34,00	133,96	15,158	0,001*	1-3
	30-39	166	31,80	5,17	35,00	149,87			2-3
	40≥	41	28,59	5,95	30,00	100,10			
Cooperation	20-29	69	82,14	20,24	82,00	130,58	2,098	0,350	
	30-39	166	85,96	18,12	90,00	144,12			
	40≥	41	83,27	16,57	84,00	129,07			
Family Participation	20-29	69	80,54	23,45	86,00	141,42	0,263	0,877	
	30-39	166	80,81	21,21	80,00	138,55			
	40≥	41	78,98	18,92	83,00	133,37			
Parent-Teacher Communication and Cooperation Scale	20-29	69	248,12	51,85	254,00	136,51	2,642	0,267	
	30-39	166	254,22	46,04	265,00	143,59			
	40≥	41	243,22	43,45	242,00	121,23			

\*p&lt;0,05

The results of the "Kruskal-Wallis H test", which is used to compare the scores of the parents participating in the research, obtained from the "Family-Teacher Communication and Cooperation Scale" according to the age of the child's teacher, are demonstrated in Table 8. As observed, no important distinction was obtained among the families' marks in the communication and expectation sub-dimensions of the scale based on the age of their child's teacher ( $p < 0.05$ ). Parents whose child's teacher is 40 years of age or older scored lower than other parents in the communication and expectation sub-dimensions of the scale. Furthermore, no statistically significant distinction among the points of families from the "Family-Teacher Communication and Cooperation Scale" general and the cooperation and family participation scale's sub-dimensions based on the age of their child's teacher ( $p > 0.05$ ).

Table 9. Correlations between Parents' Scores from the Parent-Teacher Communication and Cooperation Scale (N=276)

		Communication	Expectation	Cooperation	Family Participation	Parent-Teacher Communication and Cooperation Scale
Communication	r	1	0,845	0,634	0,433	0,680
	p	.	0,000*	0,000*	0,000*	0,000*
Expectation	r		1	0,726	0,499	0,746
	p		.	0,000*	0,000*	0,000*
Cooperation	r			1	0,788	0,939
	p			.	0,000*	0,000*
Family Participation	r				1	0,916
	p				.	0,000*
Parent-Teacher Communication and Cooperation Scale	r					1
	P					.

As Pearson tests represented in Table 9, which were performed to determine the correlations between the scores of the parents included in the study from the "Family-Teacher Communication and Cooperation Scale" in general and the communication, expectation, cooperation, and family involvement sub-dimensions of the scale. As table 9 illustrates, there were statistically significant, strong, and positive correlations among parents' marks in the aforementioned scale in general and in the communication, expectation, cooperation, and family participation sub-dimensions in the scale ( $p < 0.05$ ). Accordingly, as the families got the scores via the mentioned scale in general and from any of the sub-dimensions of communication, expectation, cooperation, and family participation in the scale increase, the scores obtained from the other dimensions increased.

### **Discussion, Conclusion, and Implications**

Perspectives of families with special needs children on the teacher, school communication, and cooperation were examined in the present study and significant differences were found depending on the variables of gender, age, marital status, education level, monthly household income, and the age of the child's teacher. Research results confirmed that families with special needs children have an increased perception level of teacher-school communication and expectation, a high perception of cooperation with the teacher, and a medium level of participation in school-teacher communication and cooperation. These findings match Heward (2003), and Taub (2006). As Quinn (1998) asserts, parents of children with special needs may perceive their children as more vulnerable to school processes due to their disability. In this regard, this reason keeps their expectations about the school strong and makes their sharing and cooperation dynamically effective. Blum, Resnick, Nelson, and St. Germaine (1991) argued that adolescents with special needs describe their relationship with their parents as good and positive in their education. However, approximately a quarter of the adolescents who participated in the study reported that they perceived their parents to be over-protective in their educational process in ways they found objectionable. Effective two-way communication between families and schools is necessary for students with special needs to achieve the goals of the system and curriculum. Undoubtedly, research confirms that the more parents and teachers share information about a student with each other, the more equipped they will both be to help the student achieve academically (American Federation of Teachers, 2007). When parents are actively involved, their children are more likely to exhibit higher grades and test scores; better attitudes towards school; more positive behavior; regular school attendance; more completed homework; less chance of needing special education services; increased chances of high school graduation; and more likely to attend post-secondary education (Cavkaytar, 2013). Parents who are interested in their child's education set high expectations for success and let them know they believe in their child's abilities create a positive environment for growth and success. When parents and teachers collaborate in the educational process, students become beneficiaries of a strong partnership. The best way to avoid conflicts between private education institutions and parents is to communicate properly with all parents regularly. According to Mulholland and Blecker (2008), successful cooperation requires shared responsibility among all parties involved. Through cooperation between teachers and parents, they can provide an effective educational process on subjects such as individual experiences, positive practices for children with special needs, teaching techniques, and strategies.

To begin with, another problem addressed in the study is to compare family-teacher communication and cooperation based on the age groups of parents. When the perceptions and thoughts of parents towards "Family-Teacher Communication and Cooperation" based on the age groups were studied, significant differences were found in terms of communication, expectation, and cooperation. Perceptions of parents in the 30-39 age group towards communication, expectation, and cooperation in the overall teacher communication and cooperation scale and the scale were found to be more positive and higher in parents in other age groups. To elaborate, it can be said that with age, the expectations of parents from their children and their goals for their own lives become more realistic. This can be explained by the fact that parents adapt more to parenthood and their own living spaces. Parents may have placed more emphasis on the contribution of communication and cooperation with the teacher. It comes to mind that parents aged 40 and over may experience communication problems since it is thought that their tolerance level towards their children is lower, and these age groups may struggle with different difficulties. Another variable analyzed in the study is the perceptions and thoughts of parents about family-teacher communication and cooperation depending on their gender. Findings revealed that the perceptions and thoughts of parents regarding parent-teacher communication and cooperation differ significantly in terms of gender. According to the averages of the groups, it was noticed that the perceptions and opinions of the female parents on the general family-teacher communication and cooperation scale and the sub-dimensions of communication, expectation, cooperation, and family participation in the scale were significantly higher and more positive than the male parents. These outputs are similar to the findings of the studies conducted by Mahoney, O'Sullivan, and Dennebaum (1990) and Sharabi and Marom-Golan (2018). In the studies conducted by Sharabi and Marom-Golan (2018) on parents of children with special needs, mothers reported higher levels of interaction and participation than fathers. Mahoney, O'Sullivan, and Dennebaum (1990) conducted a scale factor analysis of a national sample of large numbers of mothers with children with special needs in early intervention programs, including system participation, child information, family, school-educational activities, personal family assistance, and resource assistance. Five factors came to the fore. In all these factors, it was observed that mothers, as the child's parents, got high scores.

Considering the findings, another output obtained in the study are as follows. According to the marital status of the parents, it is about the perception and thoughts of family-teacher communication and cooperation. According to the research findings, perceptions and opinions on parent-teacher communication and cooperation differ based on the marital status of the parents. In the study, perceptions and views of married parents towards "Family-Teacher Communication and Cooperation" are significantly high and positive, especially in the sub-dimensions of communication and expectation. However, it did not provide a significant difference in the dimensions of cooperation and family involvement depending on the parents' marital status. This finding is similar to the results of the study by Salisbury (1987). According to Salisbury (1987), the marital status of the family affects the quality and quantity of the interactions of children with special needs with their school and teachers. Separated, single parents and single parents of children with special needs experience many difficulties in communicating with schools and teachers. This situation creates a very important source of stress for parents. A significant output of this study is that single-parent status is a negative factor in the family-school relationship. In a few studies, teachers reported lower levels of

school attendance for single parents (Epstein, 1995; Kohl, Lengua, & McMahon, 2000; Reynolds, 1992). As the number of single parents increases, this risk factor emerges as an important factor in the context of family-school relations. Single-parent children have more academic and behavioral problems than children from two-parent families (Zill, 1996). Single parents naturally have fewer resources, such as money, social support, and time to invest in their children's education and development. Thus, single parenting status is an indicator of multiple risks that can affect a parent's likelihood of being directly involved in school or the child.

To begin with, another important output was about the perceptions and thoughts of parents regarding family-teacher communication and cooperation based on their educational status. Depending on the education level of the parents, their views and perceptions of "Family-Teacher Communication and Cooperation" differ. There are significant differences in the sub-dimensions of communication, expectation, cooperation, and family involvement in the entire family-teacher communication and cooperation, especially depending on the education level of the parents. In this regard, as observed that parents with a bachelor's degree or higher have a more positive and higher view of family communication and cooperation. As the education level increases, parents' perceptions and views on school-teacher communication and cooperation demonstrate a more positive distribution. These findings are supported by the results of studies conducted in the literature by Bempechat (1998), Coleman (1987), Delgado-Gaitan (1991), Kellaghan, Sloane, Alvarez, and Bloom, (1993), and Ferrel (2012). The growing cultural diversity of the student population and the presence of parents with very low education levels have created various communication difficulties. Parents from different cultural and educational backgrounds may see the purpose of education quite differently from school staff (Bempechat, 1998). Less cultural and educational capital makes it more difficult for parents to encourage their children's learning and navigate the education system, especially at the special education level (Coleman, 1987; Delgado-Gaitan, 1991). In addition, changes in the structure and function of families over the past few decades have raised several concerns. One concern focuses on the family's capacity to provide conditions that support children's school development (Kellaghan, Sloane, Alvarez, & Bloom, 1993). According to Ferrel (2012), although vital to the learning experience of children with special needs, home-school partnerships are still often hindered by the many barriers faced by each person involved, and often parents and educators are encouraged to ensure that it is appropriate and effective to provide an optimal learning experience for their children, stops interacting without knowing how to negotiate their ways. Based on these negative interaction barriers, the fact that parents cannot show the necessary competence in interaction due to their low educational and socio-economic status plays an important role in most cases. According to Melhuish, Sylva, Sammons, Siraj-Blatchford, and Taggart, (2001), higher-quality parenting (strong school-teacher collaboration) was strongly associated with the mother's education level (but not income). To a large extent, the impact of mothers' education also increases the cognitive quality of parent/child interactions in the way they provide opportunities for intellectual skill development at home, namely problem-solving. As the interaction of parents with the school and the teacher gets stronger, the quality of the home learning environment also increases. Pursuing this further, the more educated the parent, the greater their involvement in their child's education. Kohl et al. (2000) argue that the lack of extended personal educational experience has rendered some parents lacking relevant skills or understanding of appropriate "parents as co-educators".

Parents' opinions and perceptions of family-teacher communication and cooperation differ based on their monthly household income. As concluded, parents with a monthly household income of 5000 TL or less have higher and more positive views on "Family-Teacher Communication". However, no significant distinction was obtained in terms of the family monthly income of cooperation and family involvement dimensions. There are many studies on this subject in the literature. Socioeconomic status (SES) is an important factor influencing parent involvement in many countries (Hess & Holloway, 1984). Several studies in the United States confirm that relatively wealthy, college-educated parents are more likely to participate in educational activities at school than lower-SES parents, but some studies show that low-SES parents participate as often as themselves in certain aspects of parental involvement (Lee & Bowen, 2006; Weiss et al., 2003). In his study, Tican-Başaran and Koç (2001) classified the reasons why families could not attend school education as the reasons for not attending the school mostly due to the time of the activities and activities, financial reasons, announcements, and meetings. He stated that the activities held at the school are usually held during the working hours of the families, that money is collected at the schools for various reasons, and that they are worried that money will be collected due to the economic problems of the parents that the announcements are made late or not at all.

Another significant finding regarding the child's perceptions and thoughts on parent-teacher communication and cooperation is based on the age of the teacher. Parents' family-teacher communication and expectations differ based on the age of the child's teacher. However, there is no difference depending on the age of the teacher in terms of "Parent-Teacher Cooperation" and family participation. It is noticed that the studies in the literature focus on the teacher's qualifications and competencies rather than the teacher's age. As Desforges and Abouchaar (2003) posit, the quality of teacher-parent interaction at the basic level is very important to ensure knowledge transfer and to influence mutual support and shared values. The quality and experience of the teacher come to the fore in information about programs, courses, expectations, evaluation processes, and the like. On the other hand, during the time spent in the family, information about the child is very important in terms of the role of the teacher. Home/school communication is an important channel, but with the skills of the teachers, it soon reaches a proficiency level. However, family-school supportive interaction skills can be learned by both parties. As Carlson, Maddocks, and Scardamalia (2019), Hoover-Dempsey and Sandler (1997), and Macdonald, Livingstone, and Valentine (2017) argue, the degree of parent involvement will be influenced by the school and the teacher itself. If teachers seem to care about the child's well-being, respect parents, and develop effective means of communication with families, parents are more willing and more likely to participate in their child's education. While parents tended to respect teachers' authority and expertise in the past, today they are more motivated to speak out in criticism of the teacher and be involved in shaping classroom practices. In this respect, parents' perceptions about the school are important, especially regarding how much teachers care about children with special needs and teachers' willingness to encourage communication and interaction with parents.

The last finding obtained in the study was about the relationship between the perceptions and thoughts of family-teacher communication and cooperation. Significant and positive relationships were obtained between "Parents-Teacher Communication", "Cooperation", "Expectation" and "Participation of Parents". These results are reported in the literature by Bender, (2008); Leyser and Kirk (2011); It is similar to the findings of the studies conducted by

Geldenhuis and Wevers (2013). Teachers experience as service providers of private education institutions; they provide academic direction, leading, and discipline in the educational context. While both parties regularly experience school, the experience of student parents is more discontinuous and less constructed. Families mostly get involved in educational activities through meetings, volunteer work, events, and school-oriented family associations, and by child's indication regarding the school and related behavior especially between students with special needs. An ideal environment for children includes compassionate staff who communicate with students on a regular basis (i.e., positive learner-educator relations and parent integration) can be linked to lower problematic behavior and improved academic achievement (Bryk & Driscoll, 1988; Coker & Borders, 2001; Osher et al., 2008). Griffith (2000), Koth, Bradshaw, & Leaf (2008), and Vieno, Perkins, Smith, & Santinello (2005) provided quite useful outputs related to interventions to advance school climate that may be most efficient when constructed to aim "individual-level interplay" (i.e., learner-peer and learner-educator relations, educator-family communication) within schools. The quality of parent-teacher relationship comes to the fore as a measure of the quality of family-school communication. On the other side, in the study of Reynolds and Kamphaus (2004), the correlation between parent and teacher reports on the quality of the parent-teacher relationship is significant, but not high. Given that the shared variance of the quality of the parent-teacher relationship between parent and teacher reports is only 12%, the findings suggest that each participant adds a significant amount of unique information to their assessment of the home-school relationship. Gaining the perspectives of both participants is likely to be beneficial for school psychologists and other clinicians working to support the development of collaborative family-school relationships.

A collaborative family-school relationship requires parents and teachers to engage in collective efforts to develop the competencies of children with special needs and solve their problems at school and home. In this respect, studies can be carried out to develop a cooperative school culture. Parental involvement in the education of children with special needs can be considered in many ways. In addition to communicating with the teacher, parents can participate in activities that support their children cognitively at home. Future research can be conducted by focusing on the relationship and role of parents with the school separately. Interventions can be developed and evaluated to support positive family-school collaboration. When the limitations of this study are examined, although the number of parents in the sample group is considered sufficient, it can be considered as a limitation that the sample group consists only of parents living in provincial centers. The causal perceptions of parents living in rural areas may vary with the factors affecting their lives. In future studies, data can be collected from different sources such as teachers.

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## **TÜRKÇE GENİŞ ÖZET**

### **Özel Gereksinimli Çocuğu Olan Ailelerin Öğretmen, Okul İletişim Ve İşbirliğine Bakış Açılarının Farklı Değişkenlere Göre İncelenmesi**

#### **Giriş**

Özel eğitim alanında verilen eğitimin devamlılığının oluşturulabilmesi için okul aile işbirliğinin sağlanması gerekmektedir. Karşılıklı iletişim kurulmalı, aileler ve öğretmenler birbirlerinin bakış açılarını anlamaya çalışmalıdırlar. Aileleri birer iş arkadaşı olarak gören öğretmenler ailelerle daha çok işbirliği yapmaktadırlar (Rodriguez, Blatz, & Elbaum, 2014). Çocukların sağlıklı gelişimi ve öğrenimi için gerekli olan sorumlulukları aileler, okul yönetimi ve öğretmenler kendi aralarında paylaşmalıdırlar (Eliasan & Jenkins, 2003). Nitekim aileleri birer takım arkadaşı gibi önemli bir paydaş olarak gören öğretmenler ailelerle daha çok iş birliği yapmaktadırlar. Bilinmektedir ki, etkili aile öğretmen iletişimi çocukların öğrenmelerini desteklemeye ve çok önemli olan okul aile işbirliğinin büyüyen gelişmesine yardım etmektedir. İşte bu nedenle okul aile arasında etkili bir iletişim ve işbirliğinin sağlanması önem taşımaktadır (Decker & Decker, 2005; Seplocha, 2007).

Okul aile işbirliği ile öğretmenler, okulda uygulanan eğitim ve öğretim programını daha kolay gerçekleştirebilirler, sağlıklı bir sonuca ulaşabilirler, sorumlulukları paylaşabilirler, hedeflere ulaşabilirler, iş tatminindeki artışı sağlayabilirler (Garbacz, Mcintyre, & Santiago, 2016). Araştırmalar, ebeveynlerin sürece katılımının öğretmenleri çocuklara öğretme görevine daha fazla odaklanmaya yönlendirdiğini göstermektedir. Ayrıca, ebeveynlerle daha fazla iletişim kurarak, öğretmenler öğrencilerin ihtiyaçları, bu ihtiyaçları daha iyi karşılamak için uygulayabilecekleri yöntemler ve bu amaçla ev ortamı hakkında daha fazla bilgi edinebilir. Etkileşim arttıkça özel gereksinimli çocukların ebeveynleri öğretmenler hakkında daha olumlu bir görüşe sahip olma eğilimindedir, Bu durumda da öğretmenlerin moral ve motivasyonun artmasına neden olur (Garbacz, Mcintyre, & Santiago, 2016; Whyte & Karabon, 2016).

Türkiye’de örgün eğitimde ebeveyn-okul işbirliğine yönelik görüşlerini belirlemek amacıyla gerçekleştirilmiş çalışmalar bulunmaktadır (Güleç & Genç, 2010; Güven, 2011; İnal, 2006). Bununla birlikte özel eğitim kurumlarında okul aile işbirliğine yönelik ebeveyn görüşlerinin betimsel bir yaklaşımla ele alındığı çalışmaya rastlanmamıştır. Bu çalışmanın bulgularının özel eğitimde ileriki dönemlerde gerçekleştirilecek okul-aile işbirliği uygulamalarına katkı sağlayacağı düşünülmektedir. Ayrıca ebeveyn perspektifi açısından okul-aile iletişim ve işbirliğine odaklanmak sürecin önemli paydaşı olan velilerin bakış açılarının anlaşılmasına katkı sağlayacaktır. Bu nedenle çalışmada özel gereksinimli çocukların ebeveynlerinin okul aile işbirliğine yönelik algılarının demografik değişkenler ve öğretmen özellikleri açısından

incelenmesi öncelikli olarak ele alınmıştır. Bu amaç doğrultusunda aşağıdaki alt amaçlara cevap aranmıştır.

1. Özel gereksinimli çocuğu olan ebeveynlerin öğretmenlere yönelik iletişim ve işbirliği algıları ne düzeydedir?

2. Özel gereksinimli çocuğu olan ebeveynlerin yaşı, cinsiyeti, medeni durumu, eğitim durumu, aylık hane gelir düzeyi ve çocuğun öğretmenin yaşına göre aile-öğretmen iletişim ve işbirliği ölçeğinden aldıkları puanlar farklılık göstermekte midir?

## Yöntem

### Araştırmanın Modeli

Bu çalışmada özel eğitim gerektiren çocuğa sahip ailelerin aile-öğretmen iletişim ve işbirliği konusundaki algı ve düşüncelerini incelemek amacıyla nicel araştırma yöntemlerinden betimsel tarama yöntemi kullanılmıştır.

### Evren ve Örneklem

Bu çalışma İstanbul ilinin Sarıyer ilçesinde bulunan özel eğitim ve rehabilitasyon merkezinde eğitim gören özel gereksinimli çocuğu olan ebeveynler üzerinde online olarak (Google Formlar) yürütülmüştür. Çalışmada amaçlı örnekleme yöntemlerinden kolayda örnekleme yöntemi kullanılmıştır. Bu kapsamda kolayda örnekleme yöntemine dayalı olarak çalışmaya gönüllü katılımı kabul eden 274 ebeveyn araştırmanın ölçme araçları uygulanmıştır.

### Veri Toplama Araçları

Araştırma kapsamında özel gereksinimli çocukların ebeveynlerinden oluşan katılımcıların aile-öğretmen iletişim ve işbirliği konusundaki algı ve düşüncelerini ölçmek için Atabey ve Tezel-Şahin (2011) tarafından geliştirilen "Aile-Öğretmen İletişim ve İşbirliği Ölçeği" ve "Aile Bilgi Formu" kullanılmıştır. Özel gereksinimli çocukların ebeveynlerinden oluşan çalışma grubunda Aile-Öğretmen İletişim ve İşbirliği ölçeği için Cronbach alfa katsayıları sırasıyla 0,92, 0,74, 0,92 ve 0,93 olarak hesaplanmıştır. Ölçeğin bütününe ilişkin Cronbach alfa katsayısı 0,95'tir. Elde edilen katsayılar ölçeklerin iç tutarlılığa bağlı güvenilirliğinin yüksek düzeyde olduğunu göstermiştir.

### Verilerin Analizi

Araştırma kapsamında betimsel istatistikler, aritmetik ortalama ve standart sapma ile analiz edilmiştir. Özel gereksinimli çocukların ebeveynlerinin Öğretmen İletişim ve İşbirliği ölçeğinden aldıkları puanlar üzerinde Komogrov Smirnov Testi ile normal dağılım analizleri yapılmıştır. Komogrov Smirnov Testi sonuçları özel gereksinimli çocukların ebeveynlerine ait Öğretmen İletişim ve İşbirliği ölçeği puanlarının normal dağılım varsayımlarını karşılamadığı görülmüştür. Bu durumda non-parametrik istatistik tekniklerinden Mann Whitney U Testi (cinsiyet, medeni durum) ve Kruskal Wallis Testi (yaş, eğitim durumu, aylık hane geliri, çocuğun öğretmenin yaşı) uygulanmıştır.

## Bulgular

Özel gereksinimli çocuğu olan ailelerin öğretmen, okul iletişim ve iş birliğine bakış açılarının incelendiği bu çalışmada ailelerin cinsiyet, yaş, medeni durum, eğitim durumu, aylık hane geliri

ve çocuğun öğretmeninin yaşı değişkenlerine göre anlamlı farklıklar bulunmuştur. Araştırma bulgularına göre özel gereksinimli çocuğu olan ailelerin öğretmen- okul iletişim ve beklenti algılarının çok yüksek, öğretmenle işbirliğine yönelik algılarının yüksek bununla birlikte okul- öğretmen iletişim ve işbirliğine katılımlarının ise orta düzeyde olduğu bulunmuştur. Ebeveynlerin yaş gruplarına göre Aile-Öğretmen İletişim ve İşbirliğine yönelik algı ve düşünceleri incelendiğinde iletişim, beklenti ve işbirliği açısından anlamlı farklar bulunmuştur. 30-39 yaş grubundaki ebeveynlerin öğretmen iletişim ve işbirliği ölçeği genelinden ve ölçekte yer alan iletişim, beklenti ve işbirliğine yönelik algıları diğer yaş gruplarındaki ebeveynlerde daha olumlu ve yüksek düzeyde bulunmuştur. Araştırmada analiz edilen değişkenlerden bir diğeri ise ebeveynlerin cinsiyetine göre aile-öğretmen iletişim ve işbirliğine yönelik algı ve düşünceleridir. Çalışmanın bulgularına göre ebeveynlerin cinsiyetleri açısından aile-öğretmen iletişim ve işbirliğine yönelik algı ve düşünceleri anlamlı düzeyde farklılık göstermektedir.

### **Tartışma, Sonuç ve Öneriler**

Ebeveynlerin Aile-Öğretmen İletişim, İşbirliği, beklenti ve katılımları arasında anlamlı ve pozitif ilişkiler bulunmuştur. Bu sonuçlar literatürde Bender, (2008), Geldenhuys ve Wevers (2013), Leyser ve Kirk'ün (2011); gerçekleştirdiği araştırmaların bulgularıyla benzerlik göstermektedir. Öğretmenler özel eğitim kurumlarının hizmet sağlayıcıları olarak deneyimler; rolleri, sınıflarında ve okullarında akademik eğitim, rehberlik ve disiplin vermektir. Öğrenciler ve öğretmenler okul ortamlarını düzenli olarak deneyimlerken, öğrenci ebeveynlerinin deneyimi daha aralıklı ve daha az yapılandırılmıştır. Griffith (2000), Koth ve diğ. (2008), Vieno ve diğ. (2005) göre okul iklimini iyileştirmeye yönelik müdahalelerin, okullar içindeki bireysel düzeydeki etkileşimleri (yani öğrenci-akran ve öğrenci-öğretmen ilişkileri, öğretmen-veli iletişimi) hedeflemek üzere tasarlandıklarında en etkili olabileceğine dair önemli kanıtlar ortaya koymuştur. Ebeveyn-Öğretmen ilişkisinin kalitesi, aile-okul iletişiminin kalitesinin bir ölçüsü olarak önemli ölçüde ön plana çıkmaktadır.

İşbirliğine dayalı bir aile-okul ilişkisi, ebeveynlerin ve öğretmenlerin özel gereksinimli çocukların yetkinliklerini geliştirmek ve sorunlarını okulda ve evde çözmek için kolektif çabalara girmelerini gerektirir. Bu kapsamda işbirlikli öğrenme anlayışına dayalı bir okul kültürünün geliştirilmesine yönelik çalışmalar yapılabilir. Özel gereksinimli çocukların eğitiminde ebeveyn katılımı çok yönlü olarak ele alınabilir. Ebeveynlerin öğretmenle iletişim kurmalarına ilaveten evde çocuklarını bilişsel olarak destekleyici faaliyetlere katılımları sağlanabilir. Gelecekteki araştırmalar anne ve babaların ayrı ayrı okulla ilişkilerine ve rolüne odaklanarak yürütülebilir. Olumlu aile-okul işbirliğini desteklemek için müdahalelerin geliştirilmesi ve değerlendirilmesi sağlanabilir.