



Preservice Teachers' Attitudes Toward Teacher Field Knowledge Test: Scale Development Study

Fahrettin AŞICI¹

¹Balıkesir University, Necatibey Faculty of Education, Türkiye,
fahrettin.asici@balikesir.edu.tr, <https://orcid.org/0000-0002-7329-6418>

Received : 14.11.2023

Accepted : 22.04.2024

Doi: <https://doi.org/10.17522/balikesirnef.1390464>

Abstract – Selecting teachers is a crucial aspect of the educational environment. Teacher employment in our country is carried out in line with the “Public Personnel Selection Exam (PPSE)”. Until 2013, in the PPSE model, which measures teacher competencies with “General Culture”, “General Ability” and “Educational Sciences” tests, the “Teacher Field Knowledge Test (TFKT)” has started to be applied in some branches since 2013. This study aims to develop a measurement tool to determine the attitudes of preservice teachers to TFKT. The scale was applied to 291 teacher candidates to test its validity and reliability. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were used to gather evidence regarding construct validity. As a result of the analysis, it was found that the scale had a structure with 15 items and three factors and that the scale explained 59.309 % of the total variance. To determine the reliability of the scale, the Cronbach-Alpha internal consistency coefficient was calculated, and it was found that the Cronbach-Alpha internal consistency coefficient was .894 for the test and between .700 and .883 for each factor. With the confirmatory factor analysis, the three-factor structure was verified. In this context, the findings show that the scale measures pre-service teachers' attitudes towards TFKT in a valid and reliable way.

Keywords: Teacher field knowledge test, preservice teacher, scale development, attitude.

Introduction

Today, education is considered one of the basic elements that shape the development of societies. Educational scientists, who see education as a social system, accept that three basic elements of the education system are teacher, student, and curriculum. All the literature studies on the location and importance of these elements agree on the strategic importance of the teacher in the system. Regardless of the level, the training, selection of the teacher, and providing a qualified professional formation are constantly critical issues on the agenda (Eraslan, 2006).

In this context, considering the success and quality of education, it is seen that teacher selection has an important place because the qualification system for selection, appointment, and induction is as decisive as the quality of teacher education. It is especially important to carefully examine all the qualifications of teachers who will start working as practitioners in schools and to select teacher candidates with a high level of professionalism (Yağcı & Kurşunlu, 2017).

Candidates who meet the required conditions and receive the highest score in all election conditions should be hired in the teaching profession. Accordingly, the main objective of an effective teacher selection process should be to choose the right instructor personnel to perform an effective teaching activity.

Table 1 General Competencies for the Teaching Profession

A. Professional Knowledge	
A1. Content Knowledge	She/he has an advanced and critical perspective on theoretical, methodological, and factual knowledge in his/her subject field.
A2. Pedagogical Content Knowledge	She/he has a good knowledge of the curriculum and pedagogical content knowledge of her/his subject area.
A3. Knowledge on Legislation	As an individual and teacher, she/he conducts her/himself according to the legislation related to her/his duties, rights, and responsibilities.
B. Professional Skills	
B1. Planning of Education and Teaching	She/he plans education and teaching processes effectively.
B2. Creating Learning Environments	She/he prepares appropriate teaching materials and builds a healthy and safe learning environment, where effective learning can be achieved for all students.
B3. Managing the Teaching and Learning Process	She/he manages the teaching and learning process effectively.
B4. Assessment and Evaluation	She/he uses the methods, techniques, and tools of assessment and evaluation that fit for purpose.

C. Attitudes and Values	
C1. National, Moral and Universal Values	She/he observes national, moral, and universal values.
C2. Approach to Students	She/he has an attitude that supports the development of students.
C3. Communication and Cooperation	She/he establishes effective communication and cooperation with students, colleagues, families, and other educational stakeholders.
C4. Personal and Professional Development	By carrying out self-appraisal she/he participates in personal and professional development activities.

The first purpose of a reliable teacher selection process is to determine the teacher who will provide an effective educational service and have the qualifications to fulfill the task (Tösten et al., 2012). The general competencies of the teaching profession determined by the Ministry of National Education (MoNE), taking into account the required qualifications, are given in Table 1 (MoNE, 2017).

In this context, higher education institutions that train teachers in our country aim to train teachers with specified qualifications. Just as teachers should be given training to gain competencies in higher education, it will be inevitable to implement an examination system for the competencies that should be included in the selection of teachers (Yılmaz et al., 2018).

Various applications are made to employ the graduates of the departments that constitute the source of the teaching profession in Türkiye to be employed as teachers in the Ministry of National Education. Teacher selection has been carried out with various exams that emerged due to the supply-demand understanding that the Ministry of National Education applied from the past to the present day: “Teaching Proficiency Exam”, “Civil Service Exam”, “Public Vocational Examination”, and “Public Personnel Selection Exam (PPSE)” since 2002 (Deryakulu, 2011).

According to the PPSE conducted between 2002 and 2012, the candidates applying for the "Teaching" positions in the Ministry of National Education are required to take the "General Culture" and "General Ability" tests in the Saturday morning session and the "Educational Sciences" test in the Saturday afternoon session. In this context, the scores of the candidates in this exam were calculated by using 30% of the "General Culture" test, 30% of the "General Ability" test, and 40% of the "Educational Sciences" test. When the tests are examined in terms of content, it is seen that the "General Culture" test includes Atatürk's principles and history of the Turkish Revolution, the geography of Türkiye, basic citizenship knowledge, general and current socioeconomic issues related to Türkiye, and the world, and Turkish culture and civilizations. In the “General Ability” test, there are issues related to

Turkish and mathematics and in the “Educational Sciences” test there are subjects related to educational psychology, guidance, program development, and teaching (Centre for Assessment, Selection and Placement [OSYM], 2012).

On the other hand, such exams, which are applied as a selection and appointment system at the end of the teacher training process, are criticized by many groups regardless of their quality. One of the main criticisms is whether the test method used in teacher selection measures all the qualities that a teacher should have (Gündoğdu et al., 2008).

In today's conditions where the qualifications expected from teachers are diversifying day by day, the purpose of this exam should be to select the best teachers with the desired qualifications (Atav & Sönmez, 2013) because according to Article 43 of the Basic Law on National Education No. 1739 and Article 3 of the Professional Law No. 7354, "Teaching is a specialized profession that takes over the education, training and related administrative duties of the state. Preparation for the teaching profession is provided by general culture, field education, and pedagogical formation/teaching professional knowledge". In this context, considering the content of the PPSE applications carried out between 2002 and 2012, and the general competencies of the teaching profession in Table 1, the exams applied for teacher selection are not sufficient and comprehensive. Similarly, Baştürk (2007) stated that the lack of questions about field education in PPSE created a disconnection between the “field knowledge and field education” in the faculties of education and PPSE.

In this context, in the press release of the Measurement, Selection, and Placement Center dated December 10, 2012, it was announced that in some branches (Turkish, Primary Mathematics, Science and Technology, Social Sciences, Turkish Language and Literature, History, Geography, Mathematics, Physics, Chemistry, Biology, Religious Culture and Ethics, Foreign Language (English, German, French) "General Ability", "General Culture" and "Educational Sciences" tests as well as "Teaching Field Knowledge Test (TFKT)" will be applied. MoNE explained that the purpose of the exam is to ensure that good teachers are trained in terms of field and to assign individuals who have sufficient knowledge in their fields. When the amendment is examined in this context, it can be stated that the ministry wants to select candidates who have in-depth knowledge and skills about the subjects in the curriculum of their branch and who are competent in how the subjects in their field should be taught (Demir & Bütüner, 2014). In the following years, Guidance, Classroom Teaching, and Preschool Teaching were added to the branches to which the exam was applied. On the other hand, the scores of prospective teachers who took the TFKT were calculated by giving 15% to

the "General Culture" test, 15% to the "General Ability" test, and 20% to the "Educational Sciences" test. It was also stated that the ratio of TFKT in the exam score would be 50% and that there would be a content knowledge test and a pedagogical content knowledge test in the application (OSYM, 2013).

Considering the ratio of the TFKT in the calculation of the scores based on appointment, it is seen that this test is very important for preservice teachers. As it is known, the placement of preservice teachers who want to work in state positions can be realized according to the success achieved in PPSE. For this reason, one of the most critical points for preservice teachers who graduate from education faculties is PPSE that awaits them after graduation (Odabaş, 2010) because PPSE plays a decisive role in the selection and employment of teachers for their lives (Atav & Sönmez, 2013). In this context, it is important to investigate the views of preservice teachers on the "Public Personnel Selection Examination" in general and the "Teacher Field Knowledge Test" in particular. In this context, when the relevant literature is examined, it is seen that the opinions and perceptions of preservice teachers from different branches towards PPSE have been examined (Atav & Sönmez, 2013; Epçaçan, 2016; Gündoğdu et al., 2008; Odabaş, 2010; Tösten et al., 2012; Yılmaz & Yaşar, 2016; Yağcı & Kurşunlu, 2017) and there have been various studies examining the opinions, perceptions and participation experiences of preservice teachers from different branches towards TFKT (Çelik, 2016; Demir & Bütüner, 2014; Dere & Demirci, 2022; Receptoğlu et al., 2016; Şahin & Demir, 2016; Şahin et al., 2017;). In addition, there is a scale for determining the views of primary school teachers towards PPSE developed by Tösten in 2011 and a study by Yılmaz et al. (2018) to develop a perception scale for visual arts teacher candidates regarding PPSE. In this sense, the number of measurement tools that can be used in studies on TFKT, which has an important place for preservice teachers, is limited.

In this context, the present study aims to develop a measurement tool to reveal preservice teachers' attitudes toward the "Teaching Content Knowledge Test". The resulting scale will likely be a guide for researchers who want to measure preservice teachers' attitudes in this field.

Method

The research is a scale developmental study. The stages of developing the scale prepared to determine the attitudes of pre-service teachers towards the "Teacher Field Knowledge Test" and the characteristics of the study group are given below.

Participants

The study group of this study consisted of 291 preservice teachers from different branches (Primary School Mathematics Teaching, Mathematics Teaching, Primary Teaching, Science and Technology Teaching, Social Sciences Teaching, and English Language Teaching) studying at the faculty of education of a state university located in the Central Anatolia Region of Türkiye. In determining the study group, the requirements of the preservice teachers to study in the last grade and to take TFKT within the scope of the PPSE application of the branches to be selected were taken into consideration. Although there are different opinions on what the sample size should be in scale development studies, it is frequently emphasized in the literature that a sample size of 5-10 times the total number of items in the scale (Tavşancıl, 2014) or a sample size of at least 10 times the number of items is required to determine the sample size in reliability and validity analyses (DeVellis, 2003; Tabachnick & Fidell, 2015). In this context, it can be said that the number of preservice teachers in the study group is sufficient for this study.

Development of the Item Pool

During the preparation of the item pool for the scale, first, the studies on preservice teachers, PPSE, and TFKT were examined in the literature and the indicators related to the variables were determined. In this context, attitude scales in the literature and studies examining pre-service teachers' views and perceptions of PPSE and TFKT practices were utilized.

Accordingly, an item pool of 30 items was created. As a result of the evaluation of two experts in the field of measurement and evaluation and an expert in the field of Turkish Education, 6 items were removed from the prepared draft scale, taking into account the fact that the items were not sufficiently understandable, contained more than one situation, and did not contain attitude expressions, and a draft scale form with 24 items was created. Eleven of the items in the draft scale consist of negative and 13 positive sentences. This five-point Likert-type draft scale was graded as strongly agree (5), agree (4), undecided (3), disagree (2), and strongly disagree (1). Before the factor analysis, the scores of the negative items were reversed.

Data Analysis

The analyses conducted to provide evidence for the reliability and validity of the Attitude Scale for the Teacher Field Knowledge Test (ASTFKT) can be listed as follows:

“Exploratory Factor Analysis (EFA)” and “Confirmatory Factor Analysis (CFA)” were conducted to provide evidence for the construct validity of the scale. The type of analysis in which the researcher has no information about the number of factors measured by the measurement tool and tries to obtain information about the nature of the factors measured by the measurement tool instead of testing a certain hypothesis is defined as exploratory factor analysis, and the type of analysis used in examinations to test a hypothesis developed by the researcher in line with the theory is defined as confirmatory factor analysis (Tavşancıl, 2006). In line with the EFA conducted in the SPSS package program, it was revealed which factors the items in the scale were related to. At this stage, principal component analysis, Kaiser Meyer Olkin test (KMO), and Barlett's test of Sphericity methods were used to determine the suitability of the data. The Varimax technique was used to obtain the factors. On the other hand, the LISREL package program was used for CFA and the suitability of the model revealed in EFA was checked by looking at various values in this analysis. In addition, Cronbach Alpha coefficients were calculated for the reliability of the total scale and the sub-factors that make up the scale.

Results

In this section, the findings related to the validity and reliability studies conducted for the "Attitude Scale for the Teacher Field Knowledge Test" are presented.

Findings Related to Validity

Principal component analysis was performed to reveal the data on the construct validity of the developed attitude scale and the factors loaded by the items. Kaiser-Meyer-Olkin (KMO) coefficient and Barlett's test of Sphericity values were calculated for the suitability of the data for principal component analysis (KMO= .918; $\chi^2=1832.654$; $sd=105$; $p<.00$). Kaiser (1974) states that factor analysis can be performed if the KMO value is higher than 0.5. The fact that the results of the Barlett test are significant reveals that there are significant relationships between the variables and that the data come from a multivariate normal distribution (Bartlett, 1950). In this direction, it can be stated that the data of the trial form of the scale are suitable for factor analysis.

As a result of the first EFA, it was seen that the scale items were grouped under four factors with eigenvalues greater than 1, and the variance explained by these four factors was 58.080%. Since it was stated that the factor loading should be at least .40 for an item to be included in a factor (Floyd & Widaman, 1995; DeVellis, 2003) and there should be a

minimum difference of .20 between the factor loading values of the items loading on more than one factor (Howard, 2016), at this stage, some items with a loading value below .40 and items loading on more than one factor were removed from the scale and EFA was repeated. As a result of the analyses, a final scale form of 15 items consisting of 3 factors was obtained. The eigenvalues of these factors are presented in Figure 1 and Table 2. In addition, the three-factor structure obtained from the exploratory factor analysis was tested by examining the Scree Plot graph. When Figure 1 is examined, it is seen that the break and slope lines are more prominent along the first three factors, while the graph progresses more horizontally from the third factor onwards.

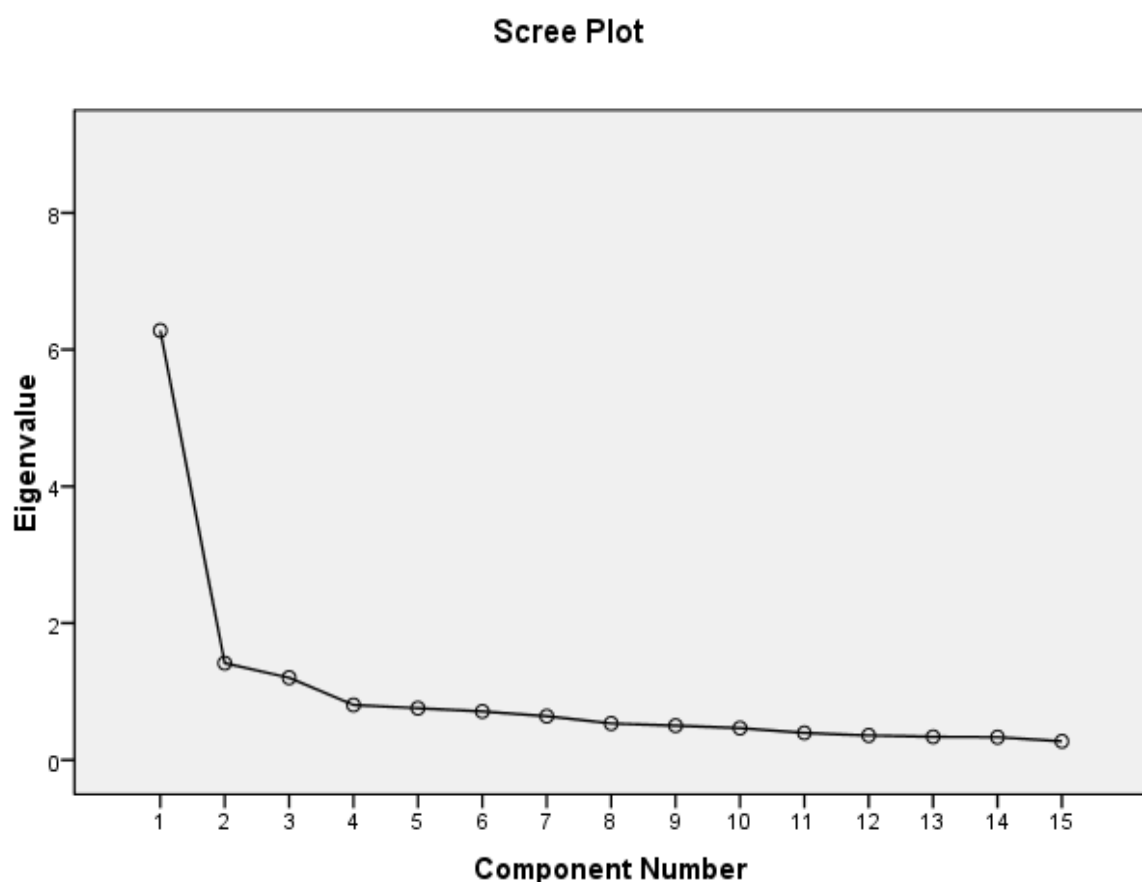


Figure 1 Scree Plot Graph Obtained from EFA

The factor loading values and explained variance ratios obtained as a result of the exploratory factor analysis conducted within the scope of the study to develop ASTFKT for preservice teachers are presented in Table 2.

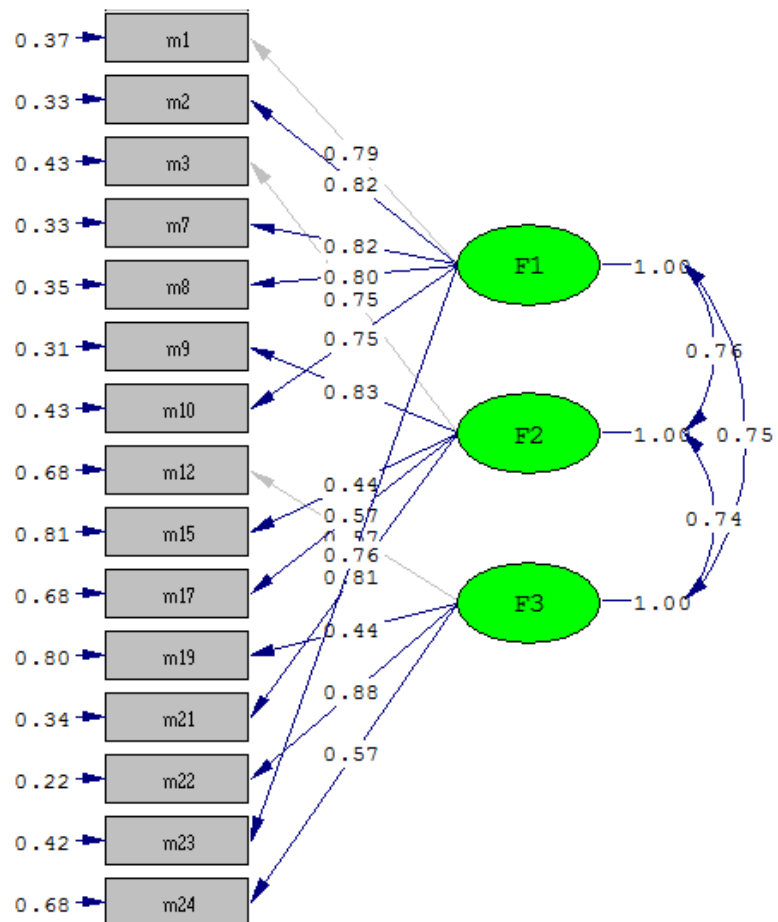
According to the EFA data in Table 2, the final 15-item scale was grouped into 3 factors, the first factor consisted of 6 items (I1, I2, I7, I8, I10, I23) with loadings ranging from .637 to .846, the second factor consisted of 5 items (I3, I9, I15, I17, I21) with loadings

ranging from .613 to .777, and the third factor consisted of 4 items (I12, I19, I22, I24) with loadings ranging from .600 to .748. In addition, the first factor with an eigenvalue of 6.280 and explained variance of 41.864% was named as "Positive Attitude towards Discrimination of TFKT", the second factor with an eigenvalue of 1.415 and explained variance of 9.434% was named as "Negative Attitude towards Application of TFKT" and the third factor with an eigenvalue of 1.202 and explained variance of 8.011% was named as "Negative Attitude towards Format of TFKT". It is also seen that all sub-dimensions of the scale explained 59.309% of the total variance.

Table 2 EFA Values Related to the Factors of ASTFKT

Items		Factor 1	Factor 2	Factor 3	
Factor 1	I1	A good teacher is one who is successful in TFKT.	.758		
	I2	A PPSE including TFKT is the right exam for selecting teachers.	.684		
	I7	I think that TFKT fills the gaps in the previous exams.	.718		
	I8	TFKT distinguishes between those who deserve to be teachers and those who do not.	.846		
	I10	TFKT is an exam that distinguishes pedagogically good candidates.	.778		
	I23	The results of TFKT are successful in distinguishing a good teacher.	.637		
Factor 2	I3	In addition to the "General Ability", "General Culture" and "Educational Sciences" tests, the TFKT is unnecessary.		.654	
	I9	A PPSE without TFKT would be better.		.689	
	I15	PPSE without TFKT is a sufficient test for teacher appointments.		.777	
	I17	TFKT is one of the obstacles in getting my life on track.		.613	
	I21	I would abolish TFKT if I could.		.616	
Factor 3	I12	I do not think prospective teachers who get high scores in TFKT are good in fact.		.620	
	I19	I do not find it right to measure content knowledge and pedagogical content knowledge with multiple-choice questions.		.748	
	I22	I do not believe that TFKT measures teacher competencies.		.627	
	I24	I would prefer a different format exam instead of TFKT.		.600	
		Eigenvalue:	6.280	1.415	1.202
		Explained Variance:	41.864	9.434	8.011
		Total Explained Variance:	59.309		

In the next stage of the study, the results obtained from the exploratory factor analysis were tested with "Confirmatory Factor Analysis" to examine the construct validity of the model, and satisfactory results were obtained. Figure 2 shows the factor distributions and loading values of the CFA.



Chi-Square=147.45, df=87, P-value=0.00006, RMSEA=0.049

Figure 2 Path Diagram Obtained as a Result of Confirmatory Factor Analysis

When the model given in Figure 2 is examined, the error variances of the items and the factor loading values of the factors that the items are related to are seen. Accordingly, it can be stated that the correlation values between the items and the factors they are related to are between .44 and .88, the relationship between factor 1 and factor 2 is .76, the relationship between factor 1 and factor 3 is .75, and the relationship between factor 2 and factor 3 is .74. On the other hand, the chi-square, chi-square/degrees of freedom and fit indices values of this model with CFA were calculated as $\chi^2=147.45$, $sd=87$, $\chi^2/sd=1.69$, $p=.00$, $RMSEA=.049$, $GFI=.90$, $AGFI=.85$, $NFI=.97$, $NNFI=.99$, $CFI=.99$ and $IFI=.99$.

It was seen that the t-values examined to determine whether the item standardization and decomposition of rates related to CFA were significant or not ranged between 2.31 and 9.52. In this context, the calculated t values were found to be significant at $p<.05$ level for all items.

As a result, it can be said that there was no need for any modification in the confirmatory factor analysis and that the 15-item measurement tool showed a good fit and was applicable in the context of the fit index values obtained after CFA.

Findings Related to Reliability

Cronbach Alpha internal consistency coefficients were calculated for the reliability of the scale during the development process of the “Attitude Scale for the Teacher Field Knowledge Test”. Accordingly, the α coefficient for the first factor of the scale, "Positive Attitude towards Discrimination of TFKT" was calculated as .883, for the second factor, "Negative Attitude towards Application of TFKT" as .793, and for the third factor, "Negative Attitude towards Format of TFKT" as .70. Cronbach's alpha coefficient for the whole scale was calculated as .894.

Conclusions and Suggestions

In this study, a scale, aiming to measure preservice teachers' attitudes towards the “Teacher Field Knowledge Test” was developed. Within the scope of the literature review conducted during the development of the scale, a draft scale was prepared by considering the studies on preservice teachers' thoughts and perceptions about PPSE and TFKT, and then this scale was applied to preservice teachers. The study was conducted to determine the validity and reliability of the model based on the data obtained after the application.

When the reliability results of the scale are examined, the reliability coefficients of the three factors in the scale and the overall scale are .70 or higher, indicating that the scale has an acceptable level of reliability (Nunnally, 1978).

On the other hand, construct and content validity were also examined for the validity of the scale. Expert opinion was used to determine the content validity of the developed scale, and exploratory and confirmatory factor analyses were used to test the construct validity. As a result of the exploratory factor analysis, it was determined that the scale had a three-factor structure and the three factors explained 59.309% of the total variance. Accordingly, the scale factors were named as "Positive Attitude towards Discrimination of TFKT", "Negative Attitude towards Application of TFKT", and "Negative Attitude towards Format of TFKT". In addition, the fit indices obtained from the confirmatory factor analysis conducted to verify the three-factor 15-item structure were found to be at an acceptable level. In this context, based on the EFA and CFA results, it can be said that this three-factor scale has a valid structure.

In summary, it was concluded that the items of the developed attitude scale both served to measure the desired characteristic and were able to distinguish between the pre-service teachers who had the desired characteristic and those who did not.

In the research conducted by Uyulgan and Akkuzu (2015), preservice teachers' expectations and negative opinions towards the TFKT were examined. As a result of the study, items such as the need for the test to be selective and discriminative came to the fore. In addition, it was also stated that preservice teachers consider the field knowledge exam necessary in terms of distinguishing between those who know and those who do not know, having a high score ratio, and ensuring the selection of a qualified teacher. Similarly, in the study conducted by Demir and Bütüner (2014), the opinions of preservice teachers on the field knowledge test were examined, and two themes were identified: findings on the content of the field knowledge test and test overall, and findings on the validity and reliability of the field knowledge test. Şahin et al. (2017) examined the opinions of pre-service preschool teachers about the field exam. In light of the data obtained in this study, the findings were analyzed under themes such as the necessity, content, and distinguishing power of the field exam. Shortly, it is possible to state that the factors of the scale obtained are consistent with the findings of other studies.

Teacher Field Knowledge Test was introduced within the scope of PPSE in 2013. However, no study has been conducted to measure the attitudes of preservice teachers towards this test or to develop a measurement tool to measure their attitudes. Nevertheless, it is important to investigate the attitudes of preservice teachers towards this exam to reveal the current situation and to relate it to the previous format of PPSE. Although attitude is a phenomenon that does not change quickly, it is a process that is not impossible to change (Keçeli, 2007). Therefore, it would be appropriate to apply the developed scale to measure the attitudes of preservice teachers during their undergraduate education.

In line with the results of this study, it may be recommended to conduct comparative studies in different branches and grade levels by applying the attitude scale obtained as a result of the study. In addition, it may also be recommended to conduct studies on determining the relationship between the attitudes of pre-service teachers and a different variable.

Compliance with Ethical Standards

Disclosure of potential conflicts of interest

There was no conflict of interest in this study.

Funding

None.

CRedit author statement

This is a single-author study.

Research involving Human Participants and/or Animals

This research involves human participants. The data for the study was collected before 2020. According to the TR Index Ethical Rules, retrospective ethics committee approval is not required for studies that used research data before 2020. Therefore, no ethics committee permission application was made within the scope of this study. However, the necessary permissions were obtained from the authorities of the relevant faculty of the state university where the study would be collected by conducting the necessary interviews regarding data collection.

Öğretmen Adayları İçin Öğretmenlik Alan Bilgisi Testine Yönelik Tutum Ölçeği Geliştirme Çalışması

Özet:

Eğitim-öğretim ortamının temel faktörlerinden biri olan öğretmenlerin, seçimi de oldukça önemlidir. Ülkemizde öğretmen istihdamı “Kamu Personeli Seçme Sınavı” doğrultusunda yapılmaktadır. 2013 yılına kadar “Genel Kültür”, “Genel Yetenek” ve “Eğitim Bilimleri” testleri ile öğretmen yeterliliklerini ölçen KPSS modelinde, 2013 yılından itibaren “Öğretmenlik Alan Bilgisi Testi” de bazı branşlarda uygulanmaya başlanmıştır. Bu çalışmanın amacı, öğretmen adaylarının ÖABT’ye yönelik tutumlarını belirlemeye yönelik ölçme aracı geliştirmektir. Geliştirilen ölçeğin geçerliği ve güvenilirliğini test etmek için 291 öğretmen adayına uygulama yapılmıştır. Yapı geçerliğine kanıt toplamak amacıyla “Açımlayıcı Faktör Analizi (AFA)” ve “Doğrulayıcı Faktör Analizi (DFA)” yapılmıştır. Yapılan analizler sonucunda ölçeğin 15 madde ve üç faktörlü bir yapıya sahip olduğu ve ölçeğin toplam varyansın % 59.309’unu açıkladığı saptanmıştır. Ölçeğin güvenilirliğini belirlemek amacıyla ayrıca Cronbach-Alpha iç tutarlılık katsayısı hesaplanmıştır. Cronbach-Alpha iç tutarlılık katsayısının ölçeğin tamamı için .894, her bir faktör için ise .700 ile .883 arasında olduğu görülmüştür. Yapılan doğrulayıcı faktör analizi ile de üç faktörlü yapı doğrulanmıştır. Bu bağlamda elde edilen bulgular ölçeğin, öğretmen adaylarının ÖABT’ye yönelik tutumlarını geçerli ve güvenilir bir şekilde ölçtüğünü göstermektedir.

Anahtar kelimeler: Öğretmenlik alan bilgisi testi, öğretmen adayı, ölçek geliştirme, tutum.

References

- Atav, E., & Sönmez, S. (2013). The views of teacher candidates about public personnel selection examination (PPSE). *Hacettepe University Journal of Education*, Special Issue, 01-13.
https://www.researchgate.net/publication/292539426_The_Views_of_Teacher_Candidates_about_Public_Personnel_Selection_Examination_PPSE
- Bartlett, M. S. (1950). Tests of significance in factor analysis. *British Journal of Statistical Psychology*, 3(2), 77-85. <https://doi.org/10.1111/j.2044-8317.1950.tb00285.x>
- Baştürk, R. (2007). Investigation of appointing teachers employed in the public education institutions in Turkey. *Hacettepe University Journal of Education*, 33, 33-40.
<https://dergipark.org.tr/en/pub/hunefd/issue/7805/102338>
- Centre for Assessment, Selection and Placement (OSYM) (2012). *Kamu personeli seçme sınavı (KPSS) kılavuzu*. OSYM.
<https://www.osym.gov.tr/Eklenti/1667,2012kpsslisanskilavuz-942012pdf.pdf?0>
- Centre for Assessment, Selection and Placement (OSYM) (2013). *Kamu personeli seçme sınavı (KPSS) lisans kılavuzu*. OSYM. https://www.trthaber.com/dosyalar/files/2013-KPSS%20KILAVUZU%206_5_2013.pdf
- Çelik, İ. (2016). Evaluation of preschool teachers' and teacher candidates' opinions on the exam of teaching field. *Journal of EKEV Academy*, (67), 163-186.
<https://dergipark.org.tr/tr/pub/sosekev/issue/71351/1147068>
- Demir, S. B., & Bütüner, K. (2014). Investigation of the opinions of pre-service social studies teachers regarding the field test. *Mersin University Journal of the Faculty of Education*, 10(2), 113-128. <https://doi.org/10.17860/efd.79620>
- Dere, İ., & Demirci, E. (2022). Experiences of takers of PPSE social studies teaching field knowledge test. *Western Anatolia Journal of Educational Sciences*, 13(1), 716-733.
<https://doi.org/10.51460/baebd.1016412>
- Deryakulu, D. (2011). Examination of PPSE educational sciences questions in terms of instructional technology-related sub-competencies and performance indicators of generic teacher competencies. *Educational Technology Theory and Practice*, 1(1), 1-23.
<https://dergipark.org.tr/tr/download/article-file/71830>
- DeVellis, R. (2003). *Scale development: theory and applications* (2nd ed.). Sage.

- Epçaçan, C. (2016). The opinions of candidate teachers about KPSS and the branch test. *Journal of Turkish Studies*, 11(3), 1065-1090.
<http://dx.doi.org/10.7827/TurkishStudies.9390>
- Eraslan, L. (2006). Öğretmenlik mesleğine girişte kamu personeli seçme sınavı (KPSS) yönteminin değerlendirilmesi. *International Journal of Human Sciences*, 8(1), 1-31.
<https://www.j-humansciences.com/ojs/index.php/IJHS/article/view/167>
- Floyd, F. J., & Widaman, K. F. (1995). Factor analysis in the development and refinement of clinical assessment instruments. *Psychological Assessment*, 7(3), 286-299.
<http://dx.doi.org/10.1037/1040-3590.7.3.286>
- Gündoğdu, K., Çimen, N., & Turan, S. (2008). Perceptions of prospective teachers in relation to civil servant selection exam (KPSS). *Kırşehir Education Faculty Journal*, 9(2), 35-43. <https://dergipark.org.tr/tr/download/article-file/1495029>
- Howard, M. C. (2016). A review of exploratory factor analysis decisions and overview of current practices: What we are doing and how can we improve?. *International Journal of Human-Computer Interaction*, 32(1), 51-62.
<https://doi.org/10.1080/10447318.2015.1087664>
- Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, 39, 31-36.
<https://doi.org/10.1007/BF02291575>.
- Keçeli, V. (2007). *The relationship between misconception and error with attitude in complex number* (Publication No. 216164) [Master's thesis, Hacettepe University]. Council of Higher Education Thesis Center.
- Ministry of National Education (MoNE) (2017). *Öğretmenlik mesleği genel yeterlikleri*.
https://oygm.meb.gov.tr/dosyalar/StPrg/Ogretmenlik_Meslegi_Genel_Yeterlikleri.pdf
- Nunnally, J. C. (1978). *Psychometric testing* (2nd ed.). McGraw-Hill.
- Odabaş, S. (2010). *Examination of prospective teachers' perceptions of KPSS (Ankara sample)* (Publication No.273073) [Master's thesis, Sakarya University]. Council of Higher Education Thesis Center.
- Recepoğlu E., Akgün K., & Aksu, S. (2016). Opinions of prospective preschool teachers regarding the public personnel selection examination (PPSE) field test. *Kastamonu Education Journal*, 24(5), 2537- 2548.
<https://dergipark.org.tr/en/pub/kefdergi/issue/27735/318053>
- Şahin, Ç., & Demir, F. (2016). Turkish language teacher candidates' perception towards teaching knowledge test. *Journal of Theory and Practice in Education*, 12(4), 979-992.
<https://dergipark.org.tr/tr/download/article-file/225171>

- Şahin, Ç., Kızılaslan Tunçer, B., & Arcan, H. C. (2017). Opinions of pre-school education teacher candidates' regarding the pre-school teacher education field exam. *The Journal of International Education Science*, (12), 318-332.
<http://dx.doi.org/10.16991/INESJOURNAL.1456>
- Tabachnick, B. G., & Fidell, L. S. (2015). *Using multivariate statistics* (M. Baloğlu, Trans. Ed.). Nobel.
- Tavşancıl, E. (2006). *Tutumların ölçülmesi ve SPSS ile veri analizi* (3rd ed.). Nobel.
- Tavşancıl, E. (2014). *Tutumların ölçülmesi ve SPSS ile veri analizi* (5th ed.). Nobel.
- Tösten, R. (2011). *The point of views of primary education teachers on the civil servant selection examination (KPSS): The case of Kars City* (Publication no.302971) [Master's thesis, Kafkas University]. Council of Higher Education Thesis Center.
- Tösten, R., Elçiçek, Z., & Kılıç, M. (2012). The point of views of primary education teachers on the civil servant selection examination (KPSS): The case of Kars City. *Dicle University Journal of Social Sciences Institute*, (7), 109-123.
<https://dergipark.org.tr/en/download/article-file/1716208>
- Uyulgan, M. A., & Akkuzu, N. (2015). Qualified teacher selection from the perspectives of pre-service teachers: The situation of students majored in the department of secondary science and mathematics education. *Kastamonu Education Journal*, 23(3), 917-940.
<https://dergipark.org.tr/en/pub/kefdergi/issue/22598/241405>
- Yağcı, E., & Kurşunlu, E. (2017). Examination of teacher candidates' opinions on the public personnel selection examination (KPSS) and the adequacy of their professional education. *International Journal of Curriculum and Instructional Studies*, 7(14), 1-14.
<https://www.ijocis.com/index.php/ijocis/article/view/115/92>
- Yılmaz, M., Laçınbay, K., Elmas, H., & Yağcı, N. (2018). The visual arts teacher's needs to teacher's knowledge test for employing teachers and perception scale development study for PPSE. *e-Kafkas Journal of Educational*, 5(2), 40-49.
<https://doi.org/10.30900/kafkasegt.435702>
- Yılmaz, M., & Yaşar, Z. (2016). Perceptions of teacher candidates for public personnel selection examination. *Bartın University Journal of Faculty of Education*, 5(2), 644-651. <https://doi.org/10.14686/buefad.v5i2.5000190982>