ADAPTATION OF THE TEACHER EMOTION SCALE INTO TURKISH CULTURE*

*Muhammet Mustafa ALPASLAN** - Özgür ULUBEY****

ABSTRACT

Recent years, emotions emerge as important affective constructs that contribute to individuals' behaviors at educational settings. In this study, it was aimed to adapt the Teacher Emotion Scale (TES) developed by Frenzel et al. (2016) into the Turkish culture and to examine its validity and reliability. A total of two hundred and eighty two elementary and secondary school teachers working in the Menteşe district of Muğla Province participated in the study. Exploratory and confirmatory factor analysis were performed to test the validity of the TES. For the reliability of the TES, Cronbach alpha values were calculated. Results of exploratory factor analysis showed that the three factors explained 56.96% of the total variance. The results of confirmatory factor analyses showed a good fit of the data and confirmed the three-factor structure of the TES. The Cronbach alpha values for the dimensions of the TES were between .70 and .75, and .82 for the whole TES. Overall, results of analyses indicated that the factor structure of the TES was in good fit and the internal reliability was in an acceptable range. In the light of the findings, it is assumed that the TES will contribute to studies addressing classroom practices of teachers and the effectiveness of in-service training activities in Turkey.

STRUCTURED ABSTRACT

Recent research on teacher education has highlighted the importance of affective characteristics including motivation, job satisfaction, self-efficacy, and emotion to increase the effectiveness of teaching and learning at schools. Among these characteristics, emotions are one of the important mental operations that connect the relations of human being to the social environment (Hargreaves, 2000; Scherer,

---

* A part of this research was presented as research paper at the 2017 International Conference on New Horizons in Education in Berlin, Germany.
** Yrd. Doç. Dr. Mugla Sitki Kocman University, Faculty of Education, El-mek: mustafalpaslan@mu.edu.tr
*** Arş. Gör. Dr. Mugla Sitki Kocman University, Faculty of Education, El-mek: oulubey@mu.edu.tr

2009). Frenzel (2014) explained teacher emotions based on the appraisal and the attribution theory, which define emotions as the individual's cognitive judgments to events and the social environment. In her model, she conceptualizes the appraisal theory as people's judgments as benign and harmful whereas the attribution theory as judgments as who or what causes the event or the situation. Research has provided evidence for the importance of emotions on the quality of education at schools. Teacher emotions are closely associated with teachers' well-being (Gross & John, 2003). Furthermore, emotions directly influence the teacher's classroom management and thus, effectiveness of teaching (Sutton & Harper, 2009). Thus, examining teacher emotions is important to increase the effectiveness of teaching and learning at schools. Qualitative methods are generally used in studies on teacher emotions in the literature (Frenzel et al., 2016). A need emerges for a quantitative instrument, which is a valid, reliable and well-grounded, to investigate teacher emotions. Because teacher emotions are a newly developing area, there is few instruments available for researchers in the literature, and we have not located any instrument assessing teaching emotions in the Turkish context. Thus, it may be beneficial to adapt the existing instruments regarding teacher emotions into the Turkish culture. In this study, it was aimed to study the validity and reliability of the Teacher Emotion Scale (TES) developed by Frenzel et al. (2016) by adapting it into the Turkish culture.

In this survey study, the TES developed by Frenzel et al. (2016) was adapted into Turkish culture and its validity and reliability were determined. Several stems were followed to correctly adapt the TES into the Turkish culture. First, items in the TES were translated into Turkish. Then, experts working in the field of educational sciences and English language checked the appropriateness of translating into Turkish. The original and the adapted version of the TES were administrated to sixty-three junior Turkish preservice teachers who were majoring at English Language teaching to determine the equivalence and the clarity of the language translation. Then, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were run with the in-service teachers who worked at elementary and secondary schools in Mugla Province. Lastly, the reliability values of the TES were examined.

The TES consists of twelve items in three dimensions as enjoyment, anger and anxiety. There are four items in each dimension. The items in the TES were in the form of a 4-Likert type and ask participants to report their responses to items as strongly disagree (1), disagree (2), agree (3) and strongly agree (4). Items on the TES were presented in a random order. In their study, Frenzel et al. (2016) reported the Cronbach's alphas of the whole TES as .90 and of its scales ranging between .70 (anxiety) and .77 (enjoyment). They also reported the results of CFA as x^2/sd = 2.745, CFI = 0.943, RMSA = 0.068 and SRMR = 0.044. To address the purpose of the study, several data analysis techniques were used. In SPSS 21 and AMOS 21 software, Kaiser-Meyer Okin (KMO) test, Bartlett Sphericity test, EFA and CFA were run (Büyüköztürk, 2017).

To determine the language equivalence of the Turkish version of the TES with its original version, both version of the TES were administered to sixty-three preservice Turkish students who were majoring in English language teaching. Spearman Brown Order Differential Correlation

Coefficient was run. The total scores of the English and Turkish versions of the TES were positively and highly correlated (r = .90, .93, .86, and .79, p <.05). Before running EFA, to test whether the data were suitable for such an analysis, Kaiser-Mayer-Olkin (KMO) and Bartlett's sphericity tests were run. The results of KMO (0.84) and Bartlett's sphericity test (χ^2 = 493.020, p< .01) showed that the data had the requisites for EFA (Ozdamar, 2013). The three components obtained by the principal components factor analysis explained 56.96% of the total variance. Rotated factor loading values were between 0.63 and 0.76 for enjoyment factor, 0.56 and 0.71 for anger factor, and 0.58 and 0.77 for anxiety factor. All factor loading values were higher than recommended cutoff value, 0.30 (Büyüköztürk, 2017).

CFA was performed to verify the validity of the three-factor structure of the TES. The ratio of Chi-square (x^2 = 63.225) and the degree of freedom (df=51) was 1.23. Additional to this, RMSEA value was 0.041, which is less than 0.05 or less, indicating a model-data fit (Hu and Bentler, 1999; Vieira, 2011). The results of the analysis were NFI = 0.97, CFI = 0.97 and TLI = 0.96 and IFI = 0.97. According to these results, it can be said that the model corresponded to near-perfect fit with the data (Kline, 2005). Cronbach alpha values of the subscales were .70 for enjoyment, .74 for anger and .75 for anxiety. For the whole TES, Cronbach alpha value was .82. These values indicated that the internal reliability of the TES was acceptable

The main purpose of this study is to adapt the TES developed by Frenzel et al. (2016) into the Turkish culture. The results of this study were consistent with the results Frenzel et al. (2016) reported. Given that the consistency obtained from different studies conducted in different countries, it can be said that the TES is a valid and reliable instrument to measure in-service teachers' teaching emotions. This work, adapting the TES into Turkish culture, will contribute to the determination of the emotional situations experienced by teachers in Turkey during the teaching process. This is important to identify reasons for the negative (anger and anxiety) or positive emotions (enjoyment) and to examine the effects of these emotions in their classroom practice to increase the quality of education. We believe that it is important for an effective teaching to determine the enjoyment of the teachers during teaching and extent this positive emotion, and to detect the causes of the negative feelings and remove these causes.

Keywords: In-service teacher education, teacher emotions, survey adaptation

ÖĞRETMEN DUYGU ÖLÇEĞİNİN TÜRK KÜLTÜRÜNE UYARLANMASI

ÖZET

Son yıllarda duygular (emotion), eğitim ortamlarında bireylerin davranışlarını etkileyen önemli duyuşsal yapılardan biri olarak ortaya çıkmaktadır. Bu çalışmada, Frenzel ve arkadaşları (2016) tarafından

geliştirilen Öğretmen Duyguları Ölçeğinin Türk kültürüne uyarlanması ve Öğretmen Duyguları Ölçeğinin geçerlilik ve güvenilirliğinin incelemesi amaçlanmıştır. Bu amaçla çalışmaya Muğla İli Menteşe İlçesinde ilkokul ve ortaokulda görev yapmakta olan toplam iki yüz seksen iki öğretmenden veri toplanmıştır. Öğretmen Duyguları Ölçeğinin geçerliliği test etmek amacıyla, açımlayıcı faktör analizi ve doğrulayıcı faktör analizi yapılmıştır. Buna ek olarak, Öğretmen Duyguları Ölçeğinin güvenirliliğini test etmek amacıyla Cronbach alfa değerleri hesaplanmıştır. Açımlayıcı faktör analizi sonuçlarına göre üç faktörlü yapının toplam varyansın %56.96 'sını açıkladığını bulunmuştur. Doğrulayıcı faktör analizlerinin sonuçlarına göre ise ilkokul ve ortaokul öğretmenlerinden toplanan veriler, üç faktörlü model yapısı ile iyi uyum değerleri sağladığını göstermiş ve Öğretmen Duyguları Ölçeğinin üç faktörlü yapısını doğrulamıştır. Öğretmen Duyguları Ölçeğinin alt boyutları için Cronbach alfa değerleri, .70 ile .75 arasında ve tüm Öğretmen Duyguları Ölçeği için ise .82 olarak hesaplanmıştır. Genel olarak, yapılan analiz sonuçları, Öğretmen Duyguları Ölçeğinin üç faktörlü yapısının iyi derecede geçerli olduğunu ve iç güvenilirliğin ise kabul edilebilir bir düzeyde olduğunu göstermiştir. Bulgular ışığında, Öğretmen Duyguları Ölçeğinin öğretmenlerin sınıf uygulamalarına ve hizmet içi eğitim etkinliklerine yönelik ülkemizde yapılacak çalışmalara katkıda bulunacağı düşünülmektedir.

Anahtar Kelimeler: Hizmet içi öğretmen eğitimi, öğretmen duygusu, ölçek uyarlama.

INTRODUCTION

Recent years, perspectives on teaching and learning have moved from the traditional views, emphasizing solely cognitive skills that a learner should have for learning, to the constructivist views, stressing the importance of cognitive skills and affective characteristics on learning process. This move, of course, has had an influence on the view that what kinds of skills and characteristics teachers should have. The current views on teacher education suggest teachers have both required cognitive skills and positive affective characteristics. Therefore, recent research on teacher education has highlighted the importance of affective characteristics including motivation, job satisfaction, self-efficacy, and emotion to increase the effectiveness of teaching and learning at schools.

As an integral part of human life, emotions are one of the important mental operations that connect the relations of human being to the social environment (Hargreaves, 2000; Scherer, 2009). In literature, there are different definitions of emotions. Some define emotion as states of motivational tendencies, physiological processes and cognitions (Keller, Chang, Becker, Goetz, & Frenzel, 2014). Others emphasize affective components including the feeling of nervousness and anxiety (Pekrun, 2006). However, all models on emotions emphasize that it is not an easy task to define emotions as positive or negative influences because emotions vary and require expressions and actions (Ellsworth & Scherer, 2003; Keller et al., 2014). Frenzel (2014) proposed a model to explain teacher emotions based on the appraisal and the attribution theory, which define emotions as the individual's cognitive judgments to events and the social environment. In her model, she conceptualizes the appraisal theory as people's judgments as benign and harmful whereas the attribution theory as judgments as who or what causes the event or the situation. She concludes that there is "reciprocal relationships between students' classroom behaviors, teacher emotions, and teachers' instructional behaviors." (p 505).

Research has provided evidence for the importance of emotions on the quality of education at schools. Teacher emotions are closely associated with teachers' well-being (Gross & John, 2003). Furthermore, emotions directly influence the teacher's classroom management and thus, effectiveness of teaching (Sutton & Harper, 2009). Positive teacher emotions influence the tendencies of teachers' implementation of new teaching ways that they got through their participations in the professional development activities (Osman, 2017). Overall, these studies indicate that examining teacher emotions is important to increase the effectiveness of teaching and learning at schools.

Qualitative methods are generally used in studies on teacher emotions in the literature (Frenzel et al., 2016). A need emerges for a quantitative instrument, which is a valid, reliable and well-grounded, to investigate teacher emotions. Because teacher emotions are a newly developing area, there is few instruments available for researchers in the literature, and we have not located any instrument assessing teaching emotions in the Turkish context. Thus, it may be beneficial to adapt the existing instruments regarding teacher emotions into the Turkish culture. In this study, it was aimed to study the validity and reliability of the Teacher Emotion Scale (TES) developed by Frenzel et al. (2016) by adapting it into the Turkish culture.

METHOD

In this survey study, the TES developed by Frenzel et al. (2016) was adapted into Turkish culture and its validity and reliability were determined.

Process of Adapting the TES into Turkish

As suggested by Hambleton and Patsula (1999), several stems were followed to correctly adapt the TES into the Turkish culture. First, items in the TES were translated into Turkish. Then, five experts working in the field of educational sciences and English language checked the appropriateness of translating into Turkish. Items were reviewed in the line with the experts' opinions. The original and the adapted version of the TES were administrated to preservice teachers who were majoring at English Language teaching to determine the equivalence and the clarity of the language translation. Item correlations between the scores from the original and adapted version of TES were examined. In addition, the pre-service teachers were asked whether the items in the two versions met each other and whether they were understandable. After the feedbacks from the preservice teachers who had expertise in Turkish and English, the Turkish version of the TES were finalized.

The Study Group

Three groups of participants, one for testing the language equivalence and the other two for testing the factor structure of the TES, were selected by utilizing convenience-sampling strategy (Creswell, 2007; Fraenkel, Wallen, & Hyun, 2012). The first group consisted of sixty-three junior Turkish preservice teachers who studied in English Language Teaching at Mugla Sitki Kocman University in the spring semester of the 2016-2017 academic year. The second group consisted of one hundred and forty in-service teachers who worked at elementary and secondary schools at Mugla Province. The data obtained from the second group were used for exploratory factor analysis (EFA). Finally, the third group consisted of one-hundred and forty-two in-service teachers who worked at the same elementary and secondary schools with the second group. The data collected from the third group was used to run confirmatory factor analysis (CFA). Of these teachers, 28 had less than 10 years, 66 have 10 to 20 years, and 48 have 20 years or more of teaching experience.

The TES

The TES consists of twelve items in three dimensions as enjoyment, anger and anxiety. There are four items in each dimension. The items in the TES were in the form of a 4-Likert type and ask participants to report their responses to items as strongly disagree (1), disagree (2), agree (3) and strongly agree (4). Items on the TES were presented in a random order. In their study, Frenzel et al. (2016) reported the Cronbach's alphas of the whole TES as .90 and of its scales ranging between .70 (anxiety) and .77 (enjoyment). They also reported the results of CFA as $\chi^2/sd = 2.745$, CFI = 0.943, RMSA = 0.068 and SRMR = 0.044.

Data Analysis

To address the purpose of the study, several data analysis techniques were used. In SPSS 21 and AMOS 21 software, Kaiser-Meyer Okin (KMO) test, Bartlett Sphericity test, EFA and CFA were run (Büyüköztürk, 2017). Details of the analyses carried out were presented in the "findings" section.

FINDINGS

Language Equivalence

In order to determine the language equivalence of the Turkish version of the TES with its original version, both version of the TES were administered to sixty-three preservice Turkish students who were majoring in English language teaching. All the scale and sub-dimensions were converted into total scores. Total scores obtained from all subscales were analyzed by running Pearson Moments Multiplication Correlation Coefficient. Before examining the correlations, Kolmogorov-Smirnov Test was run to see if the data had normal distributions. The results of this test indicated that the total score of all of the scales were not normally distributed ($p <.05$). For this reason, Spearman Brown Order Differential Correlation Coefficient was run (See Table 1).

Table 1. **Spearman-Brown order differential correlation coefficient among the Turkish and English versions of the TES**

English version of the TES	Turkish version of TES			
	The whole TES	Enjoyment	Anger	Anxiety
The whole TES	.90*			
Enjoyment		.93*		
Anger			.86*	
Anxiety				.79*

Note: * $p < .001$

As seen in Table 1, the total scores of the English and Turkish versions of the TES were positively and highly correlated (r = .90, .93, .86, and .79, $p <.05$). In the light of these results, it can be said that there was the consistency and the linguistic equivalence between both versions of the TES.

Results of EFA

To test the structural validity of the TES, EFA was run with the data collected from one hundred and forty in-service teachers. Before running EFA, to test whether the data were suitable for such an analysis, Kaiser-Mayer-Olkin (KMO) and Bartlett's sphericity tests were run. The result of KMO was 0.84, which is higher than 0.50 cutoff value (Özdamar, 2013). The result of Bartlett's sphericity test was statistically significant (χ^2 = 493.020, $p< .01$). The results from KMO and the spherecity test showed that the data had the requisites for EFA.

EFA resulted with three factors which Eigen-value is greater than 1.0. The Eigen-value and the variance explained were presented in Table 2 and Figure 1.

Table 2. **The Eigen-values and the total variance in the TES**

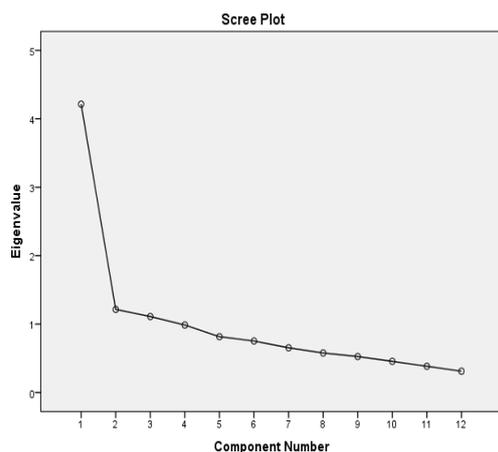| Factors	Eigenvalues	Variance explained (%)	Cumulative variance explained (%)
1	4.38	36.53	36.53
2	1.38	11.50	48.03
3	1.07	8.92	56.96
4	0.92	7.27	64.68

Figure 1: Scree plot of the factors

As seen in Table 2, the three components obtained by the principal components factor analysis explained 56.96% of the total variance. The eigenvalue of the third factors was found to be 1.07, and the eigenvalue of the following factor was found to be 0.92. This supports the three-factor structure of the TES. Addition to this, as seen in Figure 1, there are three factors on the scale. After the third factor, there is no new factor after the graph starts to flatten (Büyüköztürk, 2017). Accordingly, the graph gave us the idea that the TES consisted of three factors.

In the results of EFA, the values of the factor loadings and the anti-image covariance of the items were presented in Table 3.

Table 3. **Factor loadings and anti-image covariance**

Item	Factor loading	Anti-Image covariance
Item1	0.52	0.88
Item2	0.47	0.84
Item3	0.49	0.84
Item4	0.75	0.62
Item5	0.59	0.78
Item6	0.74	0.83
Item7	0.56	0.86
Item8	0.58	0.92
Item9	0.53	0.86
Item10	0.58	0.87
Item11	0.55	0.87
Item12	0.49	0.88

As seen in Table 3, the results of EFA showed that factor-loading values for twelve items were between 0.47 and 0.75. Additional to this, the anti-image values for items were between 0.62 and 0.92. Özdamar (2013) suggests that a value that is higher than 0.50 for anti-image covariance shows that the item highly contribute to the structure of the factor. This result showed that all items in the Turkish TES significantly contributed to the corresponding factors.

EFA was run with the oblique rotation techniques. This technique was chosen because the factors of the TES were expected to be correlated to each other. For instance, the feeling of anger may relate to the feeling of anxiety. Table 4 represents the results of factor loading values after the rotation.

Table 4. **The TES's factors and factor loading values**

Items	Enjoyment	Anger	Anxiety
Item4	0.76		
Item1	0.73		
Item10	0.70		
Item9	0.63		
Item7		0.71	
Item12		0.66	
Item11		0.58	
Item2		0.56	
Item5			0.77
Item 6			0.65
Item 3			0.61
Item 8			0.58

As seen in Table 4, the first factor consisted of four items including Item 1, Item 4, Item9 and Item10. This factor was labelled as "enjoyment". The second factor included Item 2, Item 7, Item 11 and Item 12. This factor was labelled as "anger". Finally, the third factor included Item 3, Item 5, Item 6 and Item 8. This third factor was labelled as "anxiety". Factor loading values were between 0.63 and 0.76 for enjoyment factor, 0.56 and 0.71 for anger factor, and 0.58 and 0.77 for anxiety factor. All factor loading values were higher than recommended cutoff value, 0.30 (Büyüköztürk, 2017).

Testing the Structure of the TES

CFA was performed to verify the validity of the three-factor structure of the TES. CFA was carried out with data obtained from 142 in-service teachers. Factor loading values of items were displayed in Figure 2.
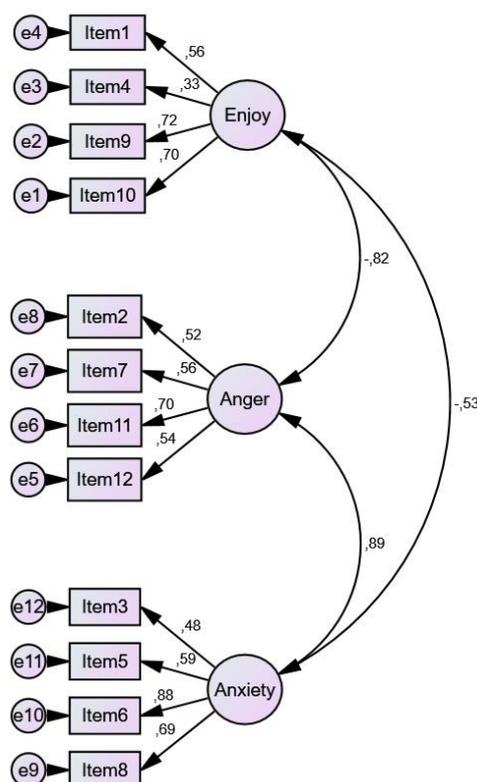
Figure 2. Factor loading values of items in the TES

The fit indices obtained from CFA were displayed in Table 5. The ratio of Chi-square ($\chi^2 = 63.225$) and the degree of freedom (df=51) was 1.23. This ratio, which was less than 3.0, indicated good fit of data to the model (Kline, 2005). Additional to this, RMSEA value was 0.041, which is less than 0.05 or less, indicating a model-data fit (Hu and Bentler, 1999; Vieira, 2011). Analysis of CFA resulted in the adjusted goodness of fit index as 0.90, the root-mean-square value (RMR) value as 0.029, and standardized root mean square (SRMR) as 0.054. Based these results, it can be stated that the model had good data fit. A higher value for the CFI (Comparative Fit Index), the NFI (Normed Fit Index), the IFI (Incremental Fit Index) and the TLI values than 0.95 indicates that the model near-perfectly fit with data (Kline, 2005). The results of the analysis were NFI = 0.97, CFI = 0.97 and TLI = 0.96 and IFI = 0.97. According to these results, it can be said that the model corresponded to near-perfect fit with the data. Cronbach alpha values of the subscales were .70 for enjoyment, .74 for anger and .75 for anxiety. For the whole TES, Cronbach alpha value was .82. These values indicated that the internal reliability of the TES was acceptable.

Table 5. **The fit indices of the model**

χ^2	sd	X^2/sd	*p*	RMSEA	SRMR	RMR	IFI	TLI	CFI
63.225	51	1.23	0.11	0.041	0.054	0.029	0.96	0.97	0.97

CONCLUSION

The main purpose of this study is to adapt the TES developed by Frenzel et al. (2016) into the Turkish culture. For this purpose, first, we consulted experts who had expertize in both languages, English and Turkish. Then, we administrated the Turkish and the English version of the TES to Turkish pre-service teachers who were majoring English languages teachings and examined if pre-service teachers' responses to the same item in both version were consistent. The correlation between the Turkish and English versions of the TES was at acceptable level ($r=.90$). Addition to this, the correlation between the same factors in the two versions were at acceptable level; for enjoyment Pearson's r was .93; for anger was .86, and for anxiety was .79. These results indicated that there was a high correlation between the two version of the TES and the both version of the TES were consistent.

Results of KMO (0.84) and Bartlett test [$\chi^2 = 493.020$, $p < 0.01$] indicated that data were suitable for EFA. Results of EFA showed that three factors explained 56.96% of the total variance. The scree plot graph also supported the three-factor structure of the TES.

There are three factors in the original form of the TES: enjoyment (Items 1, Items 4, Items 9, and Items 10), anger (Items 2, Items 7, Items 11, and Items 12), and anxiety (Item 3, Items 5, Items 6, and Items 8). Additional to EFA, CFA was run to validate the three-factorial structures of the TES. The results of CFA indicated that the model was in good fit with data. Additionally, values for factor loadings were higher than the 0.30 cut-off value. In this context, it can be said that the three-dimensional structure of the TES was confirmed by the compliance statistics obtained from CFA.

Frenzel et al. (2016) reported Cronbach alpha values for the original TES as .90 and of its dimensions ranging from .70 (anxiety) to .77 (enjoyment). In this study, we found that Cronbach alpha values of the subscales were .70 for enjoyment, .74 for anger and .75 for anxiety. For the whole TES, Cronbach alpha value was .82. Frenzel et al (2016) reported the results of their CFA as $\chi^2/sd = 2.745$, CFI = 0.94, RMSA = 0.068, SRMR = 0.044. In this study, the results of CFA were as $\chi^2/sd = 1.23$, CFI = 0.97, RMSA=0.041, and SRMR= 0.054. The results of this study were consistent with the results Frenzel et al. (2016) reported. Given that the consistency obtained from different studies conducted in different countries, it can be said that the TES is a valid and reliable instrument to measure in-service teachers' teaching emotions.

Studies addressing in-service teachers' affective constructs including teaching self-efficacy, attitude and motivation has gained attentions of many researchers in the field; yet, in-service teachers' teaching emotion such as pleasure, anxiety and anger has recently begun to take place in the literature. We have not located any study addressing in-service teachers' teaching emotion in Turkey. This work, adapting the TES into Turkish culture, will contribute to the determination of the emotional situations experienced by teachers in Turkey during the teaching process. This is important to identify reasons for the negative (anger and anxiety) or positive emotions (enjoyment) and to examine the effects of these emotions in their classroom practice to increase the quality of education. We believe that it is important for an effective teaching to determine the enjoyment of the teachers during teaching and extent this positive emotion, and to detect the causes of the negative feelings and remove these causes. The TES would pave a way for this sort of studies. For instance, the TES would help researchers identify reasons for low motivation and self-efficacy among teachers. Addition to this, teaching emotion may be related to teachers' tendency of implementing argumentation-based instructions, the communications between the teacher and the students, and be socially active as these are greatly influenced by the emotional states of the classroom and (Keles & Hand, 2017; Memisoglu, 2016; Ozpinar & Arslan, 2017). Furthermore, Future studies can examine whether the structure of

the TES can be confirmed in different groups. The validity of the adapted TES can be extended by identifying other variables that may be associated with teacher emotion.

REFERENCES

Büyüköztürk, Ş. (2017). *Sosyal bilimler için veri analizi el kitabı* (23. Baskı). Ankara: Pegem Yayınları.

Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches.* Thousand Oaks, CA: Sage.

Ellsworth, P. C. , & Scherer, K. R. (2003). Appraisal processes in emotion. In R. J. Davidson & K. R. Scherer (Eds.), *Handbook of affective sciences* (pp. 572- 596). Oxford: Oxford University Press.

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How to design and evaluate research in education* (8th ed.). New York, NY: McGraw-Hill.

Frenzel, A.C. (2014). Teacher emotions. In E.A. Linnenbrink-Garcia & R. Pekrun (Eds.), *International Handbook of emotions in education* (pp. 494–519). New York: Routledge.

Frenzel, A. C., Pekrun, R., Goetz, T., Daniels, L. M., Durksen, T. L., Becker-Kurz, B., & Klassen, R. M. (2016). Measuring teachers' enjoyment, anger, and anxiety: The teacher emotions scales (TES). *Contemporary Educational Psychology, 46*, 148-163.

Gross, J. J. & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*, 348–362.

Hambleton, R. K. & Patsula, L. (1999). Increasing the validity of adapted tests: Myths to be avoided and guidelines for improving test adaptation practices. *Journal of Applied Testing Technology, 1*(1), 1-30.

Hargreaves, A. (2000). Mixed emotions: Teachers' perceptions of their interactions with students. *Teaching and Teacher Education, 16*, 811-826.

Hu, L. T. & Bentler P. M. (1999). Cut off criteria for fit ındexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1-55.

Keles, N. & Hand, B. (2017). The questioning strategies affecting teachers' implementation levels of the argument-based inquiry, *Turkish Studies- - International Periodical for the Languages, Literature and History of Turkish or Turkic, 12*(17), 227-244.

Keller, M. M., Chang, M.-L., Becker, E.S., Goetz, T., & Frenzel, A. C.(2014). Teachers emotional experiences and exhaustion as predictors of emotional labor in the classroom: An experience sampling study. *Frontiers in Psychology*, *5* (1442), doi:10.3389/ fpsyg.2014.01442.

Kline, R. B. (2005). *Principles and practice of structural equation modeling.* New York: The Guilford Press.

Memisoglu, H. (2016). Opinions of social studies teachers about social participation, *Turkish Studies - International Periodical for the Languages, Literature and History of Turkish or Turkic, 11*(19), 621-640.

Osman, D. J. (2017). *Teachers' motivation and emotion during professional development: Antecedents, concomitants, and consequences.* Unpublished Doctoral Dissertation, University of Texas, Austin, TX.

Ozdamar, K. (2013). *Paket programlar ile istatistiksel veri analizi* (9. Baskı). Eskişehir: Nisan Kitabevi, 1. Cilt.

Ozpinar, I. & Arslan, S. (2017). An examination of secondary school mathematics teachers' opinions on mathematical communication skills, *Turkish Studies - International Periodical for the Languages, Literature and History of Turkish or Turkic, 12*(17), 337-356.

Sutton, R. E. & Harper, E. (2009). Teachers' emotion regulation. In L. J. Saha & A. G. Dworkin (Eds.), *International handbook of research on teachers and teaching* (pp. 389-401). New York: Springer.

Pekrun, R.(2006). The control-value theory of achievement emotions: Assumptions, corollaries, and implications for educational research and practice. *Educational Psychology Review*, *18*, 315–341.

Scherer, K.R.(2009). The dynamic architecture of emotion: Evidence for the component process model. *Cognition and Emotion*, *23*, 1307–1351. doi:10.1080/02699930902928969.

Vieira, A. L. (2011). *Preparation of the analysis. Interactive LISREL in practice*. London: Springer.