NOVICE TEACHER SELF-EFFICACY BELIEF: A STUDY OF SCALE DEVELOPMENT

Mualla Bilgin Aksu
Akdeniz University
muallaaksu@akdeniz.edu.tr

Çiğdem Apaydın
Akdeniz University
cigdemapaydin@akdeniz.edu.tr

Gamze Kasalak
Akdeniz University
gamzekasalak@gmail.com

Biodata

Mualla BİLGİN AKSU is Professor of Educational Sciences in the Faculty of Education, as well as the Head of Educational Administration and Supervision Program for the Graduate Institute of Educational Sciences at the University of Akdeniz in Antalya, Turkey. Her prior work experience includes twelve years in the primary schools as a teacher, six years in the Ministry of National Education as an educational expert. Her research interests include job stress, clinical supervision, peer coaching, strategic planning and TQM, teacher leadership, ethical leadership, educational leadership and policies, novice teachers, and theory - practice relations.

Çiğdem APAYDIN is assistant research as a PhD. in the Education Faculty at the Akdeniz University. Her research includes workaholic, academic staff, mentoring, corruption, equity..

Gamze KASALAK is a Ph.D. student for Educational Administration and Supervision Program. Her research interest includes organizational cynicism, ethical leadership and higher education policy.

NOVICE TEACHER SELF-EFFICACY BELIEF:
A STUDY OF SCALE DEVELOPMENT

Mualla Bilgin Aksu
muallaaksu@akdeniz.edu.tr

Çiğdem Apaydın
cigdemapaydin@akdeniz.edu.tr

Gamze Kasalak
gamzekasalak@gmail.com

Abstract

The aim of this study is to develop a scale on Novice Teacher Self-efficacy Belief (NTSB). In the development of NTSB scale, three steps, namely Study1, Study2 and Study3 were followed. Three dimensions and eighteen items were obtained as a result of the validity and reliability analyses of NTSB in Study1. In this study, it was confirmed that the dimensions of NTSB were strong in terms of internal consistency, but limited in terms of the explanatory power of the structure. In Study2, validity and reliability analyses of the scale obtained from Study1 were repeated, and a scale with ten items and two dimensions was obtained. Study3 was conducted by combining the data gathered in Study1 and Study2.

Keywords: self-efficacy, novice teacher, teacher self-efficacy, scale development, reliability, validity

1. Introduction

According to Bandura (1977), who first introduced the concept of self-efficacy, self – efficacy beliefs are the beliefs in one's capabilities to organize and succeed in activities and actions required to show a certain performance. Schunk (1991) defines self-efficacy belief as the ability to control one's emotional performance in difficult situations. Self-efficacy belief determines what one feels, and how one thinks, motivates himself/herself and behaves (Bandura, 1994). Bandura (1977, 1994) states that self-efficacy beliefs have four sources, namely performance success, indirect experiences, verbal persuasion and psychological situation. Performance success refers to mastery experiences defined as success or failure of a person in the past. Indirect experiences appear as one takes others as a model or sees others as a symbolic model. Verbal persuasion involves the advice and support that strengthen the feeling that one has the abilities required for success. In psychological situation, on the other hand, one can develop self-efficacy by alleviating fears and stress, which decrease one's performance, reduce success, and lead to abstention from negative behaviors. Thus, if self-efficacy belief is strong, one exerts more effort when confronted with difficulties and shows more determination. According to Bandura (1977), people with high self-efficacy perceive challenging tasks as a self-test that can be overcome rather than threats to be avoided. In fact, such people defy challenges by adopting some coping strategies.

Creating an environment that facilitates learning mainly depends on the ability and self-efficacy of the teacher (Altunçekiç et al., 2005). Teacher self-efficacy beliefs are teachers' personal beliefs regarding their abilities to undertake special education and learning activities successfully (Taşkın & Hacıömeroğlu, 2010). Thus, the beliefs held by the teachers play an effective and determining role in cognitive, affective, motivational and selection processes

(Bandura, 1977). As stated by Çapri and Çelikkaleli (2008), teachers' self-efficacy beliefs have a significant impact on their attitude toward teaching profession. They argue that teachers with high self-efficacy influence students' emotional, social and academic learning, and shape their academic orientations. A teacher with high self-efficacy never surrenders when faced with failure, is flexible while implementing the curriculum, adopts new instructional methods, reaches better results in terms of student achievement, and better motivates students to learn (Gibbs, 2002).

In Turkey, the studies on self-efficacy beliefs have focused on experienced teachers (Yılmaz, Yılmaz, & Türk, 2010; Demir, 2008) and particularly on pre-service teachers (Harurluoğlu & Kaya, 2009; Çoklar, 2008; Gülev, 2008; Çapri & Çelikkaleli, 2008; Demiralay & Karadeniz, 2010). Bümen (2009) maintains that although studies on teacher self-efficacy beliefs in Turkey are on the increase in recent years, they are still insufficient in number and quality. Moreover, no studies in Turkey have yet explored the self-efficacy beliefs of novice teachers. Thus, the current study was aimed at developing a self-efficacy belief scale for novice teachers. Here, a novice teacher is defined as a teacher who is employed by an educational institution on a salary or wage basis and who becomes a regular teacher at least in two years in accordance with the provisions of "Ministry of Education Code regarding the Training of Probationary Employees" (MEB, 1995). Although probationary teachers normally do not have a class, they may have to teach their own class once they are appointed due to lack of staff. Based on the provisions of the related code, a probationary teacher receives minimum 50 hours of "Basic Training" and minimum 110 hours of "Preparatory Training". The final stage for a probationary teacher is minimum 220 hours of "Practice Training". During the practice training, a willing and successful mentor teacher with sufficient teaching experience is charged with educating the novice teachers (MEB, 1995), which emphasizes the significance of the support to be given to the novice teachers who have recently entered the profession and who have a desire to apply what they learnt in their training sessions.

2. Method

In the development of the scale, three steps, namely, Study 1, Study 2 and Study 3 were followed. These steps are explained in detail below.

2.1.Study 1: Sampling

The study involves 334 novice teachers appointed to public or private educational institutions in Antalya province in Turkey in 2007–2008 academic year. Data were collected by Antalya Provincial Directorate of National Education at the beginning of the preparatory training program. A total of 254 novice teachers answered the questionnaire, meaning that the return rate was 76%. The average age of the novice teachers in the study was 24 years. 167 of the participants were female, while 87 were male. 161 of the participants graduated from education faculty, while 40 graduated from faculty of science and letters, 18 from faculty of vocational technical education, and 33 from other faculties.

2.1.1. The Development of Data Collection Tools

Novice teacher self-efficacy belief scale was developed by the researchers in the current study. In the development of the scale, an item pool was created based on theoretical knowledge and other research studies. The items in the pool were then analyzed by the researchers, and in the end, 33 items that are assumed to measure self-efficacy belief most appropriately were selected. All items in the scale were answered on a six-point Likert scale [not at all true (1), barely true (2), slightly true (3), quite true (4), mostly true (5) and exactly true (6)].

2.1.2. Exploratory Factor Analysis

The SPSS software package version 13.0 was used for testing the construct validity of the scale. The Cronbach's alpha for the scale was .895, and the Cronbach's alpha coefficients for the three dimensions (efficacy in teaching, general professional efficacy, and efficacy in classroom management) were .790, .790 and .797, respectively. These values show a high degree of internal consistency (Hair et al., 1998). The Cronbach's alpha coefficients for each item of the scale and corrected item-total correlation for each item are given in Table 1. Cronbach's alpha coefficient values should be ≥ 0.70, and item-total correlation of ≥ 0.25 is considered to be acceptable (Nunnally & Bernstein, 1994; Carretero-Dios et al. 2007). As seen in Table 1, the Cronbach's alpha coefficient values for the items in the scale and corrected item-total correlation coefficients are within acceptable range.

Table 1. *Item Analysis for the Novice Teacher Self-Efficacy Belief Scale*

Dimensions	Items	Arithmetic Mean	Standard Deviation	Corrected Item-Total Correlation	Alpha when item is omitted
Efficacy in teaching	I believe I can rectify my students' misconceptions.	4.98	.886	.447	.785
	I can give satisfactory answers to my students' questions.	5.16	.782	.558	.754
	At the end of the lesson, my students accomplish the objectives I set.	4.56	.853	.598	.748
	I can create a comfortable and safe learning environment for my students.	5.23	.870	.581	.749
	I can plan my lessons considering my students' level of readiness.	4.85	1.010	.529	.763
	I can use the necessary verbal and visual techniques (image, chart, graphic, formula etc.) effectively making use of instructional technology.	4.97	1.036	.576	.754
General professional efficacy	I can act in accordance with professional principles and obligations.	5.42	.815	.524	.764
	I can guide or orient my students based on their abilities.	5.05	.891	.686	.733
	I can establish effective communication with parents.	5.16	.973	.572	.753
	I can give appropriate reinforcers to my students.	5.31	.850	.559	.757

I can help my students use Turkish language correctly and properly.	5.27	.840	.439	.777
I can teach my students how to reach information.	5.14	.876	.593	.751
I can organize some activities for my students who need special education.	4.20	1.340	.382	.811
Efficacy in classroom management — I can speak in a way that has an impact on my students (correct stress, intonation, pronunciation etc.).	5.19	.847	.665	.734
I can intervene with the problematic students using body language and tone of voice.	4.92	.998	.561	.764
I can maintain my students' interest and attention throughout the lesson with the activities I implement.	4.51	.935	.654	.733
I can use the class time efficiently.	4.98	.955	.504	.781
I can make my shy students active in class or group work by motivating them.	4.95	.962	.522	.776

As far as descriptive statistics is concerned, the item "I can create a comfortable and safe learning environment for my students." in efficacy in teaching dimension, the item "I can act in accordance with professional principles and obligations." in general professional efficacy dimension, and the item "I can speak in a way that has an impact on my students (correct stress, intonation, pronunciation etc.)." in efficacy in classroom management dimension have the highest mean scores (Table 1).

Prior to factor analysis, appropriateness of the data for the analysis was tested in the construct validity study. In this test, corrected item-total correlations were performed for each item in the scale, and nine items were eliminated as their correlation with the corrected item total was ≥ 0.25 or below. The remaining items were then subjected to factor analysis, and it was found that KMO = .898 and Bartlett Test = 2025.099 (p= .000). After it was determined that the data is appropriate for factor analysis, five dimensions with eigenvalues greater than 1.0 were obtained with the remaining 24 items. This resulted in a total explained variance of 54.187%. When the factor loadings of five dimensions with a total of 24 items were examined, five items were eliminated since the difference between the factor loadings of those items was found to be .10 (Tavşancıl, 2002), and varimax orthogonal rotation method was used again. As a result of rotation, a structure with four dimensions and 19 items was obtained. Four dimensions explained 55.6% of the total variance. However, as a result of this rotation, one item with a factor loading below .30 (Hair et al., 1998) was eliminated, and finally a scale with a total of 18 items was obtained. As a result, items with an approximate

value on more than one factor were removed from the scale. Moreover, in the first stage, five items and in the second stage, one item that did not load on any factors and whose factor loadings were below .30 were eliminated. In the third analysis, 18 items were retained in the scale, and three dimensions were obtained. The scale explained 51.7% of total variance as a result of factor analysis, and the percentage of variance explained by each dimension was 19.141%, 17.241% and 15.314%, respectively. Factor loadings for the items range between .753 and .476 for the first dimension, between .716 and .473 for the second dimension, and between .755 and .474 for the third dimension. The KMO value was calculated to be .900, and the result for Bartlett test of sphericity was 1693.194 and p = .000 (p<0.001) (Table 2). When KMO value is .60 or above, Bartlett's sphericity test results are expected to be statistically significant (Jeong, 2004). In the current study, KMO value and Bartlett's sphericity test result were found to be significant, meaning that exploratory factor analysis could be conducted for the scale. The findings of the exploratory factor analysis are shown in Table 2.

Table 2. *The findings of Exploratory Factor Analysis and the Cronbach alpha values for the factors*

Item number	Items	Efficacy in teaching	General professional efficacy	Efficacy in classroom management
1	I believe I can rectify my students' misconceptions.	.753		
2	I can give satisfactory answers to my students' questions.	.719		
3	At the end of the lesson, my students accomplish the objectives I set.	.613		
4	I can create a comfortable and safe learning environment for my students.	.598		
5	I can plan my lessons considering my students' level of readiness.	.554		
6	I can use the necessary verbal and visual techniques (image, chart, graphic, formula etc.) effectively making use of instructional technology.	.476		
7	I can act in accordance with professional principles and obligations.		.716	
8	I can guide or orient my students based on their abilities.		.702	
9	I can establish effective communication with parents.		.671	
10	I can give appropriate reinforcers to my students.		.610	
11	I can help my students use Turkish language correctly and properly.		.580	
12	I can teach my students how to reach information.		.577	
13	I can organize some activities for my students who need special education.		.473	
14	I can speak in a way that has an impact on			.755

	my students (correct stress, intonation, pronunciation etc.).			
15	I can intervene with the problematic students using body language and tone of voice.			.754
16	I can maintain my students' interest and attention throughout the lesson with the activities I implement.			.636
17	I can use class time efficiently.			.554
18	I can make my shy students active in class or group work by motivating them			.474
Total Variance Explained	=	%19.141	%17.241	%15.314
Total (51.696%)				
Reliability Coefficients	=	.790	.790	.797
Total (.895)				
KMO	=			
.900				
Bartlett's Test of Sphericity Chi-Square (Sd=153) = 1693,194 (p= .000)				

2.1.3. Confirmatory Factor Analysis

The scale which was obtained through exploratory factor analysis and which consists of three dimensions and 18 items was also tested with confirmatory factor analysis. Lisrel 8.54 software package (Jöreskog & Sörbom, 2001) was used for confirmatory factor analysis. Goodness-of-fit index calculated as a result of error variance (I 10 - I12 = -.18 and I 17 - I 18 = .22) and two modifications made in the same dimension (Hair et al., 1998) were compared with general measures, and it was observed that the values were within acceptable range. Goodness-of-fit indexes for the model obtained as a result of the confirmatory factor analysis of the scale was examined, and it was seen that RMSEA (the root mean square error of approximation) = 0.045, AGFI (adjusted goodness of fit index) = 0.90, GFI (goodness of fit index) = 0.92, NFI (normed fit index) = 0.96, CFI (comparative fit index) = 0.98, SRMR (standardized root mean square residual) = 0.046, and RMR (root mean square residual) = 0.044 conformity statistics of the scale with three dimensions were within acceptable range (Schermelleh- Engel, Moosbrugger & Müller, 2003). Goodness-of-fit indexes and acceptable values are given in Table 3.

Table 3. *Goodness-of-fit Indexes for the Novice Teacher Self-efficacy Belief Scale*

Goodness-of-fit Indexes	Goodness-of-fit	Acceptable goodness-of-fit	Suggested model
χ^2	$0 \leq \chi^2 \leq 2sd$	$2sd < \chi^2 \leq 3\ sd$	196.74 (sd=130)
χ^2/sd	$0 \leq \chi^2/df \leq 2$	$2 < \chi^2/df \leq 3$	1.51
RMSEA	$0 \leq RMSEA \leq 0,05$	$0,05 < RMSEA \leq 0,10$	.045
GFI	$0,95 \leq GFI \leq 1,00$	$0,90 \leq GFI < 0,95$	.92
AGFI	$0,90 \leq AGFI \leq 1.00$	$0,85 \leq AGFI < 0,90$	.90
NFI	$0,95 \leq AGFI \leq 1.00$	$0,90 \leq NFI < 0,95$	.96
CFI	$0,97 \leq CFI \leq 1.00$	$0,95 \leq CFI < 0,97$	.98
RMR	$0 \leq RMR \leq 0,05$	$0,05 < RMR \leq 0,10$	.044
SRMR	$0 \leq SRMR \leq 0,05$	$0,05 < SRMR \leq 0,10$	.046

Source: Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the Fit of Structural Equation Models: Tests of Significance and Descriptive Goodness of Fit

Measures. Methods of Psychological Research Online, 8(2), 52. (Used upon receiving written permission from the first author.)

The model with three dimensions, factor loadings, coefficient of error, and interdimensional correlations are shown in Figure 1.

In addition to goodness-of-fit indexes, the composite reliability of the indicators in the scale was measured with tests of validity and reliability. Two reliability tests, namely construct reliability and variance extracted were used. Composite reliability is similar to alpha coefficient. It shows the internal consistency of the indicators in a factor, and the acceptable rate of reliability is .70. Variance extracted should be above .50. Below are the formulas for construct reliability and variance extracted (Hair et al., 1998, 611–612):

Construct reliability= (∑ Factor loadings) 2 / [(∑ Factor loadings) 2 + ∑Error coefficient]

Variance extracted= (∑Factor loadings 2) / [(∑Factor loadings2) + ∑Error coefficient]

When the composite reliability values of the three dimensions in the scale given in Figure 1 are examined, for the first dimension, construct validity is .79, and variance extracted is .39. For the second and third dimensions, construct reliability is .81 and .79, respectively, and variance extracted is .40 and .43, respectively. As evident from these figures, construct reliability for the dimensions is above .70, and variance extracted is below .50, which indicates that while the internal consistency of the dimensions constituting the novice teacher self-efficacy belief scale is strong, their explanatory power is limited. Thus, Study2 is needed to improve the original scale.

Figure 1. *Structural Equation Model for the Novice Teacher Self-Efficacy Belief Scale*
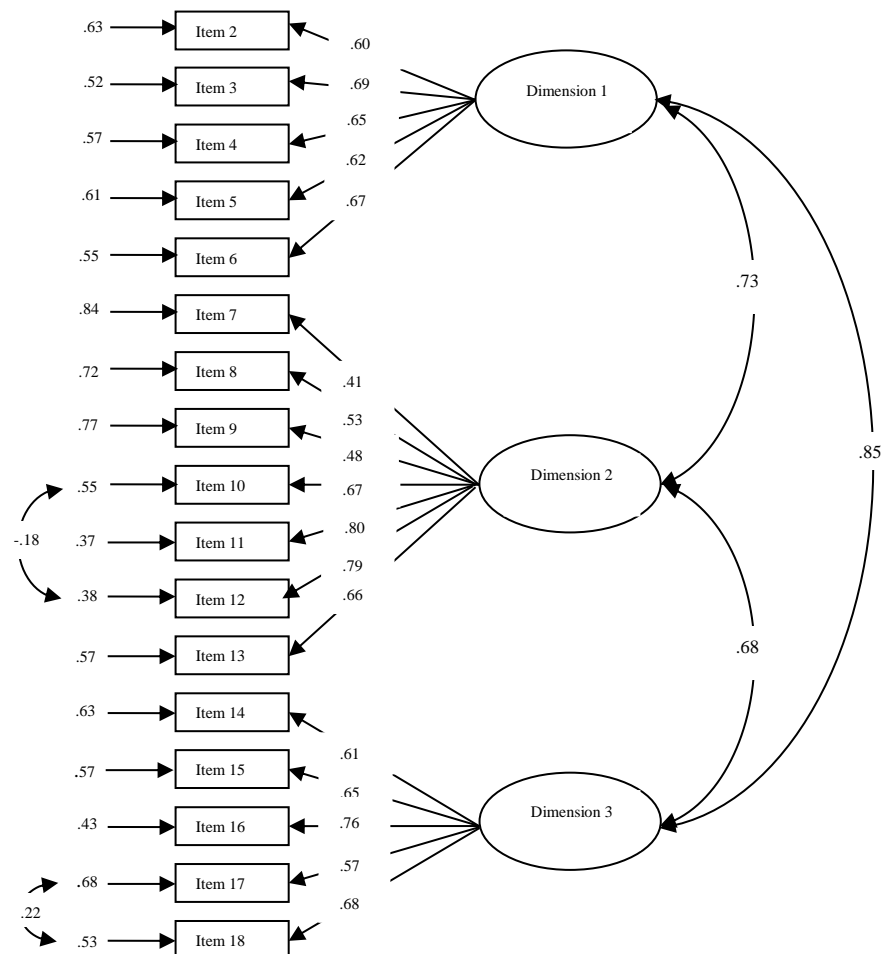
2.2. Study2: Sampling

The study involves 214 novice teachers appointed to public or private educational institutions in Antalya province in Turkey in 2010-2011 academic year. Data were collected by Antalya Provincial Directorate of National Education at the beginning of the preparatory training program. Some questionnaires were removed from the study due to inappropriate marking done by the participants. The analysis was carried out on 192 acceptable questionnaires, meaning that the return rate was 89%. The average age of the novice teachers in the study was 26 years. 120 of the participants were female, while 72 were male. 128 of the participants graduated from education faculty, while 29 graduated from faculty of science and letters, and 35 from other faculties.

2.2.1. The Development of Data Collection Tools

As a result of the analyses conducted in Study1, the scale with five dimensions and 33 items was changed into a scale with three dimensions and 18 items. Study 2 was done to test whether the new model with three dimensions and 18 items complies with the existing data. Thus, the scale developed in Study1 was reapplied to a new sample of 192 teachers.

2.2.2. Exploratory Factor Analysis

Principal component analysis and varimax rotation method were used in the exploratory factor analysis of the scale, and two dimensions (efficacy in classroom management, and efficacy in teaching) and 10 items were obtained. The Cronbach's alpha for the scale was .90, and the Cronbach's alpha coefficients for the two dimensions were .74 and .87, respectively. These values show a high degree of internal consistency (Hair et al., 1998). As seen in Table 4, the Cronbach's alpha coefficient values for the items in the scale and corrected item-total correlation coefficients are within acceptable range.

Table 4. *Item Analysis for the Novice Teacher Self-Efficacy Belief Scale*

Dimensions	Items	Arithmetic Mean	Standard Deviation	Corrected Item-Total Correlation	Alpha when item is omitted
Eficacy in classroom management	I can give appropriate reinforcers to my students.	5.16	.882	.624	.856
	I can help my students use Turkish language correctly and properly.	5.08	1.037	.578	.864
	I can speak in a way that has an impact on my students (correct stress, intonation, pronunciation etc.).	5.34	.854	.690	.848
	I can intervene with the problematic students using body language and tone of voice.	5.06	.941	.570	.863
	I can maintain my students' interest and attention throughout the lesson with the activities	4.67	.955	.719	.843

I implement.				
I can use class time efficiently.	5.07	.855	.713	.845
I can make my shy students active in class or group work by motivating them.	5.05	.925	.663	.850
I can give satisfactory answers to my students' questions.	5.19	.805	.517	.707
I can create a comfortable and safe learning environment for my students.	5.01	.923	.644	.551
I can plan my lessons considering my students' level of readiness.	4.98	.892	.538	.683

(left margin rotated label: Efficacy in Teaching)

When descriptive statistics is examined, the item "I can give satisfactory answers to my students' questions" in efficacy in teaching dimension, and the item "I can speak in a way that has an impact on my students (correct stress, intonation, pronunciation etc.)" in efficacy in classroom management dimension have the highest mean scores (Table 4).

As a result of the factor analysis of the scale, KMO = .931 and Bartlett's test of sphericity = 1772.907, meaning that data are appropriate for factor analysis. Varimax orthogonal rotation method of principal component analysis was applied to the data, and two dimensions were obtained. These two dimensions explained 53.272% of the total variance. When the factor loadings of the scale were examined, two items were eliminated since the difference between the factor loadings of those items was found to be .10, and also, one item with a factor loading below .30 was eliminated, and varimax orthogonal rotation method was used again. As a result of the rotation, two dimensions and 15 items were obtained. The scale explained 53.5% of total variance. In the third factor analysis, one item whose factor loading was below .30, and four items which were not appropriate for classification in terms of size were removed from the scale. As a result, total variance explained increased to 60%. This rate was found satisfactory by the researchers, and thus the rotation was finalized. As a result, a scale with two dimensions and 10 items was obtained. The percentage of variance explained by each dimension was 36.7% and 23.3%, respectively. Factor loadings for the items range between .765 and .581 for the first dimension, and between .845 and .768 for the second dimension. The KMO value of the scale was calculated to be .899, and the result for Bartlett test of sphericity was 822.524 p=.000 (p<0.001) (Table 5). The findings of the exploratory factor analysis are shown in Table 5.

Table 5. *The findings of Exploratory Factor Analysis and the Cronbach alpha values for the factors*

Item No	Statements	Efficacy in Classroom management	Efficacy in Teaching
1	I can give appropriate reinforcers to my students.	.765	
2	I can help my students use Turkish language correctly and properly.	.756	
3	I can speak in a way that has an impact on my students (correct stress, intonation, pronunciation etc.).	.727	
4	I can intervene with the problematic students using body language and tone of voice.	.712	
5	I can maintain my students' interest and attention throughout the lesson with the activities I implement.	.689	
6	I can use class time efficiently.	.689	
7	I can make my shy students active in class or group work by motivating them.	.581	
8	I can give satisfactory answers to my students' questions.		.845
9	I can create a comfortable and safe learning environment for my students.		.768
10	I can plan my lessons considering my students' level of readiness.		.680
Total Variance Explained= Total (%60.083)		%36.746	%23.337
Reliability Coefficients = Total (.887)		.739	.871
KMO = .899			

Bartlett's Test of Sphericity Chi-square (Sd=45) = 822.524 (P=.000)
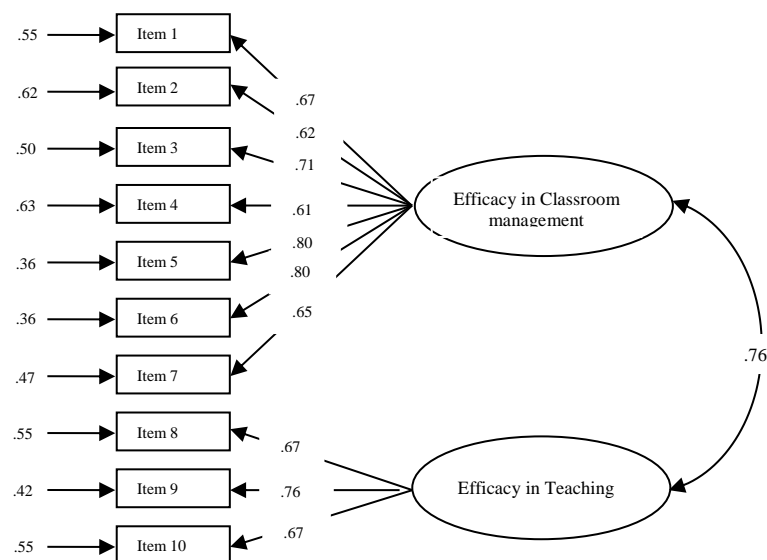
2.2.3. Confirmatory Factor Analysis

Goodness-of-fit indexes for the model obtained as a result of the confirmatory factor analysis of the scale were examined, and the conformity statistics of the model with two dimensions was within acceptable range (Schermelleh- Engel, Moosbrugger, & Müller, 2003). Goodness-of-fit indexes for the model were found to be χ^2 = 74.65 (sd= 34), χ^2 /sd= 2.19, RMSEA=0.079, GFI=0.93, AGFI=0.88, NFI=0.96, CFI = .98, SRMR= .047 and RMR= .039. As a result of the confirmatory factor analysis of the scale and goodness-of-fit indexes for the items, the model is a good fit. Factor loadings, error coefficients, and interdimensional correlations for the model are shown in Figure 2.

According to the data in Figure 2, when the composite reliability values of the two dimensions in the scale are examined, it is observed that construct reliability of the efficacy in classroom management dimension is .87 and variance extracted is .50. As far as efficacy in teaching dimension is concerned, construct reliability is .74, and variance extracted is .49. While construct reliability for the dimensions is above .70, variance extracted is .50 or slightly below .50. Thus, it is confirmed that the internal consistency of the dimensions

constituting the novice teacher self-efficacy belief scale is strong, whereas their explanatory power is limited.

When Study1 and Study2 are evaluated together, it is seen that in Study1, the number of items was reduced from 33 to 18, and three dimensions were obtained. The scale explained 51.696% of total variance. The scale was then subjected to confirmatory factor analysis, and two modifications were made. Since the internal consistency of the scale was strong in terms of composite reliability values, but the explanatory power was limited, Study2 was conducted. In Study2, the scale was subjected to exploratory factor analysis again, and the original scale with 18 items was changed into a scale with two dimensions and 10 items. It was found that there was an increase in the percentage of variance explained (60%) by the new scale obtained in Study2. When the new scale was subjected to confirmatory factor analysis, it was found that the scale was limited in composite reliability particularly in explanatory power although fit indexes were good. As a result, the scale with two dimensions and 10 items was a good fit to the data; however, Study3 was carried out to see whether increasing the amount of data will eliminate limitedness. Although the scale was acceptable as is, Study3 was conducted combining the data in Study1 and Study2 to test the scale with compositional data.

Figure 2. *Structural Equation Model for the Novice Teacher Self-Efficacy Belief Scale*
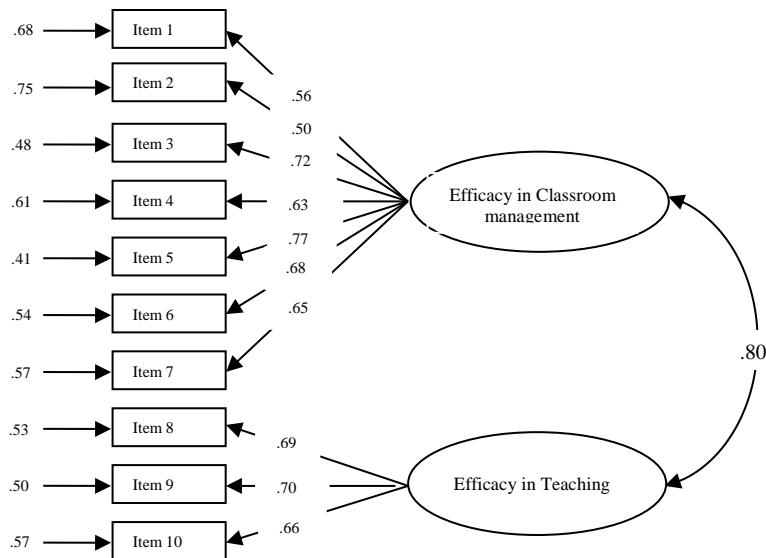

2.3. Study 3

In Study 3, a sample of 446 participants was used by combining the data in Study1 and Study2, and the validity of the model with two dimensions and 10 items was tested.

2.3.1.Confirmatory Factor Analysis

Goodness-of-fit indexes for the model obtained as a result of the confirmatory factor analysis of the scale were examined, and the conformity statistics of the model with two dimensions was within acceptable range (Schermelleh- Engel, Moosbrugger, & Müller, 2003). Goodness-of-fit indexes for the model were found to be χ^2 = 126.66 (sd= 34), χ^2 /sd= 3.72, RMSEA=0.078, GFI=0.95, AGFI=0.91, NFI=0.96, CFI = .97, SRMR= .043 and RMR= .036. Chi-square is a test which determines whether the data fits the model and which is affected by the size of the sample. That χ^2/ sd = 3.72 ≤ 5 means that the data moderately fits the model (Sümer, 2000). Factor loadings, error coefficients, and interdimensional correlations for the model are shown in Figure 3.

According to the data in Figure 3, when the composite reliability values of the two dimensions in the scale are examined, it is observed that construct reliability of the efficacy in classroom management dimension is .74 and variance extracted is .49. As far as efficacy in teaching dimension is concerned, construct reliability is .83, and variance extracted is .42. Construct reliability for the dimensions is above .70, while variance extracted is below .50. It is seen in Study3 that increasing the amount of data does not have an impact on construct validity results. Thus, it may be asserted that the internal consistency of the dimensions constituting the novice teacher self-efficacy belief scale is strong, and that goodness-of-fit index obtained from confirmatory factor analysis is acceptable. Moreover, it seems that composite reliability is satisfactory, but variance extracted is limited. As a result, in Study 3, it was observed that the model obtained in Study2 was confirmed.

Figure 3. *Structural Equation Model for the Novice Teacher Self-Efficacy Belief Scale*

3. Conclusion

The scale developed as a result of the current research study was called " Novice Teacher Self-efficacy Belief Scale". The development of the scale involved three steps, namely Study 1, Study 2 and Study 3. Study 1 involved novice teachers appointed to the educational institutions in Antalya province in Turkey in 2007-2008 academic year. In Study 1, within the scope of validity and reliability studies of the novice teacher self-efficacy belief scale with 33 items, exploratory and confirmatory factor analyses were carried out. The scale explained 51.7% of total variance as a result of the exploratory factor analysis, and the Cronbach's alpha value for the scale was .895. As a result, a scale with three dimensions and 18 items was obtained. In the confirmatory factor analysis applied to test construct reliability, goodness-of-fit indexes were found to be within acceptable range following the two modifications. However, when composite reliability values were examined, it was found that construct reliability was strong, whereas variance explained was limited. Thus, Study 2 was initiated. Study 2 involved novice teachers appointed to the educational institutions in Antalya province in Turkey in 2011–2012 academic year. In Study 2, as a part of validity and reliability studies of the novice teacher self-efficacy belief scale with 18 items, exploratory and confirmatory factor analyses were performed. As a result of exploratory factor analysis, total variance explained was calculated to be 60.1%, and the Cronbach's alpha value for the scale was .887. As a result, a scale with two dimensions and 10 items was obtained. Goodness-of-fit indexes were found to be within acceptable range as a result of the confirmatory factor analysis done to test construct validity. When composite reliability

figures were examined, it was found that construct reliability was strong, while variance explained was limited. Consequently, it was observed that the scale with two dimensions and 10 items was a good fit to the data; however, to see whether increasing the amount of data will eliminate the limitedness, Study3 was carried out. Although the scale was acceptable as is, Study3 was conducted combining the data in Study1 and Study2, thus testing the scale with compositional data. As a result, the model obtained in Study2 was confirmed in Study3.

The researchers in the current study suggest that the scale be used by other researchers to test the validity and reliability of the scale in other contexts. Thus, while an awareness of novice teacher self-efficacy beliefs is created, a contribution can also be made to the prevalence and development of the scale.

References

Altunçekiç, A., Yaman, S., & Koray, Ö. (2005). The Research on prospective teachers' selfefficacy belief level and problem solving skills. *Kastamonu Education Journal. 13*(1), 93- 102.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: Freeman.

Bandura, A. (1977). Self – efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191- 215.

Bandura, A. (1994). Self-efficacy. In V. S. Ramachaudran (Ed.), *Encyclopedia of human behavior* (Vol. 4, pp. 71-81). New York: Academic Press. (Reprinted in H. Friedman [Ed.], *Encyclopedia of mental health.* San Diego: Academic Press, 1998)

Bümen, N. (2009). The investigation of self - efficacy belief primary and secondary school teachers': The example of Izmir. XVIII. *National Educational Sciences Congress*, 1- 3 October 2009, İzmir.

Brouwers, A. & Tomic, W. (2001). The factorial validity of scores on the teacher ınterpersonal self-efficacy scale. *Educational and Psychological Measurement,* 61, 433–445.

Carretero-Dios, H., De los Santos-Roig, M. & Buela-Casal, G. (2007). Influence of the difficulty of the matching familiar figures test–20 on the assessment of reflection impulsivity: An item analysis. *Learning and Individual Differences*, doi:10.1016/j.lindif.2007.10.001

Çapri, B. & Çelikkaleli, Ö. (2008). Investigations of perspective teachers' attitudes towards teaching and professional self- efficacy beliefs according to their gender, programs, and faculties. *Inonu University Journal of the Faculty of Education, 9*(15), 33- 53.

Çoklar, A. N. (2008). *Assessing the self-efficacy of teacher candidates concerning the educational technology standards.* (Doctoral dissertation), Anadolu University, Turkey.

Demiralay, R. & Karadeniz, Ş. (2010). The effect of use of information and communication technologies on elementary student teachers' perceived information literacy self-efficacy. *Educational Sciences: Theory & Practice, 10*(2), 841- 851.

Dellinger, A. B., Bobbett, J. J., Olivier, D. F., & Ellet C. D. (2008). Measuring teachers' self-efficacy beliefs: Development and use of the TEBS-Self. *Teaching and Teacher Education*, *24*(3), 751–766.

Friedman & Kass (2002). Teacher self-efficacy: A classroom-organization conceptualization. *Teaching and Teacher Education*, *18*(6), 675–686.

Gibbs, C. (2002). *Effective teaching exercising self – efficacy and thought control of action.* Retrieved from http://www.leeds.ac.uk/educol/documents/00002390.htm

Gülev, D. (2008). *Preservice biology teachers' misconceptions, self- efficacy beliefs and attitude toward biology teaching in biology subjects.* Master's Thesis, Gazi University, Turkey.

Hair, J.F., Anderson, R.E., Tahtam, R.L., & Black, W.C. (1998). *Multivariate data analysis* (5th ed.). New Jersey: Pearson Education.

Harurluoğlu, Y. ve Kaya, E. (2009). The self-efficacy beliefs towards biology teaching of pre-service biology teachers. *Uludag University The Journal of Education*, *22*(2), 481-

496.

Jeong, J. (2004). *Analysis of the factors and the roles of HRD in organizational learning styles as identified by key informants at selected corporations in the Republic of Korea*, Doctoral dissertation. Texas A & M University, USA.

Jöreskog, K.G. & Sörbom, D. (2001), *Lisrel 8: User's Reference Guide*, Scientific Software International, Chicago.

MEB (1995). Ministry of Education regulations regarding training to novice officers. The Journal of *Tebliğler, 2423*, Retrieved from http://mevzuat.meb.gov.tr/html/42.html.

Nunnally, J. C. & Bernstein, I. J. (1994). *Psychometric Theory*. New York: McGraw-Hill.

Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online, 8*(2), 23-74, Retrieved from http://www.mpr-online.de.

Schunk, D.H. (1991). Self efficacy and academic motivation. *Education Psychologists, 26*(3&4), 207 -231.

Skaalvik, E.M. & Skaalvik, S. (2007). Dimensions of teacher self-efficacy and relations with strain factors, perceived collective teacher efficacy, and teacher burnout. *Journal of Educational Psychology*, *99*(3), 611–625.

Sümer, N. (2000). Structural equation model: Basic concepts and sample applications. *Turkish Psychological Articles, 3*(6), 49–74.

Taşkın, Ç. Ş. & Hacıömeroğlu, G. (2010). Adaptation of the teachers' efficacy beliefs system - self form and primary teachers' self - efficacy beliefs. *Dokuz Eylül University Buca Faculty of Education Journal,* 27, 63 – 75.

Tavşancıl, E. (2002). The measurement of attitudes and data analysis with SPSS. Ankara: Nobel Press.

Yılmaz, G., Yılmaz, B. & Türk, N. (2010). Over - graduate thesis physical education and sports teacher's self-efficacy of their jobs (Nevşehir city model). *Selçuk University Journal of Physical Education and Sport Science, 12*(2), 85 -90.