

## Development of classroom management anxiety scale for candidate teachers (CMAS-CT) and analysis of its psychometric properties

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### Abstract

The aim of the study is to develop a new scale, called the 'classroom management anxiety scale for candidate teachers (CMAS-CT)'. This study was carried out on three different groups consisting of university senior class students from Mehmet Akif Ersoy University in Turkey. The psychometric properties of the scale (CMAS-CT) were analysed by means of item analysis, exploratory factor analysis (EFA), confirmatory factor analysis (CFA) and internal consistency and split-half methods. The EFA results demonstrated that the scale comprised of five factors. As a result of the EFA, the factor loadings of 25 items in the five factors were found to vary between 0.39 and 0.85. These five factors explained 54% of the total variance. CFA results demonstrated that five dimensional model provides good fit as per obtained fit index values. In conclusion, CMAS-CT can be used as a reliable and valid measure for Turkish university senior class students.

**Keywords:** Classroom management, anxiety, classroom management anxiety, candidate teacher.

## 1. Introduction

Behavioural change among individuals is largely accomplished by means of schools which are special frames established towards education. Class; is the common living places where teachers and students come face to face, where education and training are conducted and where learning takes place (Aydin, 2009; Donmez, 2008). At the same time, the classroom is the place where educational goals are transformed into behaviour (Saritas, 2005), and the focal point of an educational process aiming positive behaviour on students (Oral, 2012). In the classroom where teacher and students interact, the main task of the teacher is to provide learning and create classroom layout (Kazu, 2007; Savage, 1999). Therefore, it is necessary for the teacher to have enough information related to class management and have the ability to use this information (Demirtas, 2012).

Classroom management is perceived as the creation and management of an effective learning environment (Good & Brophy, 2000). With another approach, classroom management is a determination of classroom rules, providing a suitable classroom layout, effective management of education and time and developing a positive learning environment by supervising student behaviours (Celik, 2012). Furthermore, these are efforts by the teacher to organise and carry out academic and administrative activities with a view to establish and maintain an effective environment (Ritter & Hancock, 2007). Briefly, classroom management can be defined as all activities towards removing barriers that disrupt education in the classroom (Basar, 1999; Erdogan, 2001; Saritas, 2005; Weinstein, 1996). In this regard, effective classroom management is considered as the first step to become successful in education (Agaoglu, 2003; Demirel, 2004).

As for good management of the class, many variables play a role in the creation of a positive classroom and education atmosphere. These can be listed as teachers, students, environment, school, education management and surrounding (Basar, 1999; Haris, 1991). However, the most critical element of an effective classroom management is a teacher. The teacher is the integrator of other elements and determiner to some degree (Agaoglu, 2008; Basar, 1999). Organisation and management of the learning environment and experiences are under the responsibility of the teacher (Aydin, 2009; Savage, 1999). Realisation of experiences within the classroom as per predetermined objective, the establishment of a climate suitable for learning, establishment and development of an effective relationship structure are basic duties expected from a teacher. Considering the classroom as a film set, a teacher in this film has the role of a director and leading actor (Cetin, 2009). In this regard, the teacher should be able to integrate fast, all-round and unforeseen events simultaneously for the purpose of classroom objectives. Teacher, more than knowing how to conduct training and how to solve problems encountered during training, should be able to decide and implement which things were within his/her knowledge and when to implement these ideas (Acikgoz-Un, Ozkal & Gungor-Kilic, 2003). Therefore, the teacher is expected to be not only an effective educator but also an effective manager (Demirtas, 2012). However, effective classroom management is not an easy task not only because of the inherent complexity of classroom management but also based on the unique characteristics of the classroom itself. According to research studies conducted on classroom management, problems with classroom management, no matter during whatever period in the teaching profession, are one of the main difficulties experienced by teachers (Acikgoz, 2007; Demirtas, 2012). Especially, teachers having just entered the profession and spend most of their energy and effort to control the classroom. Creating a positive work environment in the classroom and to provide discipline in the classroom are perceived as the most important and anxiety problem (Demirtas, 2008; Evertson & Weinstein, 2006).

It is also seen that classroom management anxiety is originated from teacher's character traits; also, lack of knowledge regarding classroom management, lack of sufficient experience and insufficient field experience (Oral, 2012). In addition, discourses relating to the hardness of classroom management by experienced teachers and that teacher-student conflict is the biggest anxiety are also determinative in this respect (Rothschild, Morris & Brassard, 2006). Today, it is found out that issues

such as increase in number of students, occurrence of associated learning difficulties and professional incompetence anxiety teachers who being their profession (Wagner, 2008). For example, in the research conducted by Jones and Jones (2007), it has been identified that the most common anxiety experienced by teachers beginning their careers is classroom management. Researchers have found that the majority of teachers who are in their initial professional year need support mostly in the field of classroom management. Eighty-two percent of the teachers who being their profession in their prime consider ineffective classroom management and 57% of them consider disruptive student behaviours as the most important obstacle in their professional success, and they indicate their unpreparedness against coping with issues related to classroom management. In another research conducted on teacher candidates, it was found out that classroom management is the most anxiety area for teacher candidate after the area of assessment. After the practical training attended by teacher candidates, it was determined that, although a decrease was experienced in other types of anxiety, there was no reduction in teacher candidates' anxiety on classroom management (Morton, Vesco, Williams & Awender, 1997). In another study, it was reported that newly graduated teachers showed mostly issues related to classroom management as the biggest challenge. In addition to this, research studies have reported that newly graduated teachers are unprepared for emotional and behavioural problems posed by students and they get shocked when faced with such issues (Oral, 2012). However, teachers' starting their career through sound supporting themselves largely depends on their being free from professional anxieties they feel against their occupation (Tasgin, 2006).

Considering the effect on classroom management of teacher candidates' anxiety in classroom management, it is crucial to determine issues that anxiety teacher candidates face in terms of classroom management. However, according to a literature review conducted in Turkey within the context of this study, a scale developed to measure teacher candidates' anxieties for classroom management was found (Oral, 2012). Developed by Oral, these scales are called 'Behaviour Management Anxiety Scale' and 'Teaching Management Anxiety Scale'. Behaviour management anxiety scale consists of three dimensions. The scale consists of 30 items in total including 10 items in communication in the classroom, 12 items in the management of student's behaviour and eight items in a teacher's behaviour management. Teaching management anxiety scale consists of 26 items in total including 14 items for the teaching management scale and 12 items in the evaluation. In a field literature review conducted abroad, there was not available any independent scales developed to measure teacher candidates' classroom management anxiety. However, a scale is found which is used with a view to measure teacher candidates' anxieties from the point of classroom management, evaluation, pedagogics and relationships with workers. The scale consisting of 26 items was developed by Morton et al. (1997) by means of updating Hart's (1987) teacher candidate anxiety scale.

Analysing the field literature, it can be seen that there is a limited number of scales developed to measure classroom management anxieties of teacher candidates. It is believed that the research we have conducted because of the need based on lack of knowledge will contribute to knowledge in the related field and to detect components in classroom management anxieties. With reference to all these facts, the purpose of this study is to develop classroom management anxiety scale for teacher candidates (CMAS-CT) and to examine psychometric properties of the scale.

## **2. Method**

### **2.1. Participants**

This study was carried out on three different groups consisting of university senior class students from Mehmet Akif Ersoy University in Turkey. First study group consists of 20 senior class students including 12 females (60%) and 8 males (40%). Second study group consists of 404 senior class students including 254 females (62.9%) and 150 males (37.1%). Third study group consists of 250 senior class students including 143 females (57.2%) and 107 males (42.8%). Total study group consists of 674 senior class students. First group was

used pilot application. Second group was used development scale and exploratory factor analyses (EFA). Third group was used confirmatory factor analyses (CFA).

## **2.2. Scale development process**

Senior class students attending the Faculty of Education in Burdur Mehmet Akif Ersoy University as of 2014–2015 academic years were asked to write a text explaining the features of classroom management anxiety. By considering these texts, various classroom management and anxiety scales and theoretical framework and the field literature, 42 classroom management anxiety expressions were established. These expressions were sent to five field experts regarding whether they were classroom management anxiety expression, they resembled with other items and were consistent, and scale trial form was prepared by taking related field experts' views on these expressions. Afterwards, 20 teacher candidates were applied with pilot application to check whether expressions in testing scale were comprehensible and they were asked to specify incomprehensible items. Following analysis of these items and arrangement of incomprehensible expressions, the final form for a testing form of the scale was achieved. In this form, there are 37 direct five reverse graded expressions.

## **2.3. Collection of research data**

In this study, to determine classroom management anxiety of teacher candidates, a 42-item five-point Likert-type scale was applied on senior class students in their classes who have taken classroom management course in the Faculty of Education, Burdur Mehmet Akif Ersoy University as of the 2014–2015 academic years. Researchers have made necessary explanations about the scale and the application process before starting the application. Application took about 15 minutes.

## **2.4. Analyzing the data**

Exploratory and CFA were conducted within the scope of validity of teacher candidates' classroom management anxiety scale. Factor analysis is a statistical method aiming at explaining and measuring the same structure by gathering in one point through the use of fewer factors (Buyukozturk, 2012). Before starting EFA, Kaiser-Meyer-Olkin (KMO) and Barlett's sphericity test results were used to check whether data structure was suitable for factorisation. As a result of the analysis, it was concluded that data structure was suitable for factorisation and EFA was applied. Then, 'first-level' CFA was applied. To determine the reliability of the scale, Cronbach Alpha ( $\alpha$ ) internal consistency coefficient, split half test reliability, item-total score correlation and upper-lower 27% group comparison analyses were applied. Teacher candidates' classroom management anxiety variable was tested with CFA for the confirmation of theoretical structure that is established from five components including professional incompetence perception, providing motivation, facing unexpected situations, management of difficult groups and establishment of positive learning environment factor.

## **3. Findings**

In this section, findings about validity and reliability studies for 'teacher candidates' classroom management anxiety scale' are provided.

### **3.1. Findings related to structural validity**

#### **3.1.1. Explanatory factor analysis**

To put forward structure validity of the scale, explanatory factor analysis was applied. With a view to review the suitability of data to factor analysis prior to factor analysis, it was controlled whether there are extreme values in data set. Significantly z table values at 0.01 level for single-variable extreme values towards dependent and independent variables were reviewed and 10 data exceeding

3.29 were removed from the data set. For multivariate extreme values, Mahalanobis distance was analysed and was not found over the value of one (Tabachnick & Fidell, 2007). Thus, 404 data were used for the explanatory factor analysis.

The KMO coefficient calculated for compatibility of the sample with factor analysis was found to be 0.90. Barlet field test value  $\chi^2$ : 3587.459 was found to be significant as  $p < 0.05$ . In addition, the common factor variance (Communalities) of analysed items was observed to range between 0.273 and 0.739. The fact that KMO value (Buyukozturk, 2012) was found to be higher than 0.60 shows that the data are suitable for factor analysis. After ensuring suitability of data set to explanatory factor analysis, factor analysis process was conducted.

As a result of factor analysis of 42-item teacher candidates' classroom management anxiety test form and as a result of the Varimax rotation process, 10 factors were revealed having an eigenvalue higher than 1.00. The variance of these 10 factors explained related to the scale is 54.143. As a result of Anti-image Correlation process applied in conjunction with Varimax rotation technique, items 5, 14, 15 and 16 were removed from the scale since they gave close load to two separate factors and item 21 was removed since it was only one item in the 10th factor. Afterwards, the re-rotation process was carried out with remaining scale items. As a result of the second Varimax rotation process, KMO coefficient was found to be 0.917. As a result rotation process, eight factors were revealed with the eigenvalue higher than 1.00. Variance of these eight factors explained related to the scale is 56.774. As a result of rotation, item 8 was removed since there was only one item in the eighth factor. Afterwards, the re-rotation process was carried out with remaining scale items. As a result of the third Varimax rotation process, KMO coefficient was found to be 0.918. As a result rotation process, seven factors were revealed with the eigenvalue higher than 1.00. Variance of these seven factors explained related to the scale is 55.08. As a result of rotation, items 6, 7, 9, 10, 11 and 12 give close load to two separate factors. That's why these items were removed from the scale. Afterwards, the re-rotation process was carried out with remaining scale items. As a result of the fourth Varimax rotation process, KMO coefficient was found to be 0.917. As a result rotation process, six factors were revealed with the eigenvalue higher than 1.00. The total variance of these six factors explained related to the scale is 55.173%. As a result of rotation, items 28 and 40 gave close load to two separate factors. That's why these items were removed from the scale. Afterwards, the re-rotation process was carried out with remaining scale items. As a result of the fifth Varimax rotation process, KMO coefficient was found to be 0.912. As a result rotation process, five factors were revealed with the eigenvalue higher than 1.00. The total variance of these five factors explained related the scale is 52.778%. As a result of rotation, items 35, 37, 38 and 39 gave close load to two separate factors. That's why these items were removed from the scale. Afterwards, the re-rotation process was carried out with remaining scale items. As a result of the sixth Varimax rotation process, KMO coefficient was found to be 0.897. As a result rotation process, five factors were revealed with the eigenvalue higher than 1.00. The total variance of these five factors explained related the scale is 54.143%. As a result of analyses, while items 17, 18, 19, 26, 27, 30, 31, 36, 37, 41, 42 are included in the first factor; items 1, 2, 3 and 4 are included the second factor; items 23, 24, 25 and 29 are the third factor; items 32, 33 and 34 in the fourth factor and items 13, 20 and 22 are included in the fifth factor.

Factor analysis was performed again on the final CMAS-CT. Eigenvalues for factor weights obtained as a result of factor analysis on 25-point teacher candidates' classroom management anxiety scale, variances explained by factor and revealed total variances are shown in Table 1.

**Table 1. Eigenvalues and explained the percentage of variance belonging to teacher candidates' classroom management anxiety scale**

<b>Factors</b>	<b>Eigenvalues</b>	<b>The percentage of explained variance</b>	<b>The percentage of the total explained variance</b>
Factor 1	7.248	28.992	28.992
Factor 2	2.052	8.208	37.200

Factor 3	1.871	7.483	44.683
Factor 4	1.238	4.954	49.637
Factor 5	1.127	4.506	54.143

Analysing Table 1, it can be seen that 25 items in the scale are gathered under the five factors with eigenvalues higher than 1. The variance explained by these five factors together is 54.143%. With the first factor, 28.992% of the variance regarding the scale can be explained; with the second factor, 8.208% of the variance regarding the scale can be explained; with the third factor, 7.483% of the variance can be explained; with the fourth factor, 4.954% of the variance regarding the scale can be explained; with the five scales, 4.506% of the variance regarding the scale can be explained. Loads belonging to these five effective factors were found as shown in Table 2.

**Table 2. Results of the factor analysis of the scale**

No	Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Total
1 (41)	I am concerned when I see students getting bored while I am lecturing.	0.669					
2 (36)	I feel worried when someone outside the classroom watches me while I am lecturing.	0.618					
3 (26)	I have the anxiety to tell something wrong while lecturing.	0.606					
4 (17)	While lecturing, I feel worried about being unable to answer.	0.602					
5 (27)	I feel like I cannot do my job well when students look at me blankly.	0.594					
6 (37)	I feel worried about my application teacher will warn me about classroom management.	0.559					
7 (42)	I feel nervous when I am deficient in any subject I am going to lecture about.	0.558					
8 (30)	I am concerned about students not take my warning seriously during courses.	0.535					
9 (31)	I worry about being unable to give suitable responses to the problem while intervening during the course.	0.517					
10 (18)	I worry about being unable to behave justly to all students during the course.	0.426					
11 (19)	I feel stressed while managing interclass conflicts.	0.389					
12 (1)	I have concerns about being unable to make students eager to learn.		0.853				
13 (2)	I worry about unable to re-gather students' attention after they distract from the course.		0.833				

14 (3)	I'm worried about being unable to grab the attention of students during the course.	0.825	
15 (4)	I feel stressed about the idea of the inability to teach a lesson according to students' interests.	0.525	
16 (24)	When I enter the lesson without any preparations, I get in a lather.	0.79	6
17 (23)	When something unplanned occurs in the course, I get in a lather.	0.74	3
18 (25)	I feel panic about the idea that I may lose my control over students in the course.	0.67	3
19 (29)	I feel panic about any incidents such as accidents, injury in the classroom.	0.50	8
20 (33)	I try to find many excuses in classes where there are students with special needs.	0.739	
21 (32)	I feel stomach pain before entering any classroom where I generally feel trouble teaching a lesson.	0.683	
22 (34)	I shrink from telling lesson to crowded classrooms.	0.479	
23 (20)	I'm comfortable about to create a learning environment with participation*	0.739	
24 (13)	I enjoy telling lesson*	0.722	
25 (22)	I'm happy when I create a positive learning environment in the classroom*	0.629	
Variance explanation percentage			54.143

\*Reverse scored items.

Although it can be seen that the scale is in a five-factor structure in Table 2, eigenvalue of the first factor was found to be 7.248. In Scree plot graphic drawn according to eigenvalues, a highly accelerated drop is observed after the first factor. This situation shows that the scale may have a general factor (Buyukozturk, 2012). Determined by factors of the scale are called professional incompetence perception, providing motivation, encountering unexpected situations, the management of difficult groups and creating a positive learning environment, respectively. Furthermore, total point can be received from the scale.

### 3.1.2. Confirmatory factor analysis

CFA studies for the 25-item main form of the scale were applied to 250 students. In studies conducted towards analysis availability of data set, 12 data demonstrating extreme values and one-third of which left blank were not included in analyses. The values of the goodness-of-fit test were given in Table 4.

**Table 3. The values of the goodness-of-fit test**

$\chi^2$	$\chi^2/df$	P-Value	NFI	RFI	CFI	GFI	AGFI	SRMR	IFI	RMSEA
548.17	2.06	0.000	0.91	0.91	0.95	0.85	0.82	0.07	0.95	0.06

\* $p < 0.001$ .

Fit indices of the model obtained from DFA and Chi-square value ( $\chi^2 = 548.17$ ,  $N = 250$ ,  $SD = 265$ ,  $p = 0.00$ ) were found to be significant. Fit index values were found to be RMSEA = 0.06, NFI = 0.91, CFI = 0.95, IFI = 0.95, RFI = 0.91, GFI = 0.85 and RMR = 0.07, respectively. It is indicated that it is enough that GFI, NFI, RFI, CFI and IFI goodness of fit indices are greater than 0.90, and RMSEA is lower than 0.08 (Cokluk, Sekercioglu & Buyukozturk, 2010; Hu & Bentler, 1999). Accordingly, we can say that five-dimensional model provides good fit as per obtained fit index values.

### 3.2. Findings regarding the reliability of classroom management anxiety scale

#### 3.2.1. Item total score correlation

Analyses related to the comparison of item scores of lower 27% and higher 27% groups with item total correlation were applied on sampling group consisting 404 people, item-total score correlation values and  $t$ -test results were given in Table 4.

**Table 4. Item total correlation coefficients and lower–higher 27% group comparison results**

Item	27% group comparison results	
	Item total correlations <sup>a</sup>	$t$ (Lower 27%–Higher 27%) <sup>b</sup>
1 (41)	0.437	10.654**
2 (36)	0.525	14.132**
3 (26)	0.573	12.981**
4 (17)	0.512	11.392**
5 (27)	0.467	10.364**
6 (37)	0.545	14.666**
7 (42)	0.475	10.612**
8 (30)	0.537	13.274**
9 (31)	0.617	14.172**
10 (18)	0.479	12.632**
11 (19)	0.451	9.957**
12 (1)	0.390	8.319**
13 (2)	0.429	9.348**
14 (3)	0.482	9.987**
15 (4)	0.491	10.799**
16 (24)	0.505	11.486**
17 (23)	0.553	12.482**
18 (25)	0.552	12.568**
19 (29)	0.554	12.119**
20 (33)	0.341	7.230**
21 (32)	0.463	11.695**
22 (34)	0.543	15.193**
23 (20)	0.404	11.436**
24 (13)	0.302	8.167**
25 (22)	0.301	8.166**

<sup>a</sup> $n = 404$ ; <sup>b</sup> $n_1 = n_2 = 109$ ; \*\* $p < 0.001$ .



Analysing the Table 4, it can be seen that corrected item-total correlations of classroom management anxiety range between 0.301 and 0.617. In general, we can say that items with item-total correlation of 0.30 and higher can distinguish individuals very well (Buyukozturk, 2012). Furthermore, it can be seen that  $t$  (SD = 216) values related to differences in 27% lower and higher groups' item scores range between 8.167 and 15.193, and that obtained  $t$  values are meaningful at 0.001 level. These results can be interpreted in a way that items' validities in the scale are high, they distinguish students and they are items towards measuring similar behaviour (Buyukozturk, 2012).

### **3.2.2. Cronbach's alpha internal consistency analysis**

The scale was applied to 404 people and Cronbach's alpha internal consistency coefficient for the whole scale was found to be 0.89, respectively. For the first factor of the scale, Cronbach alpha internal consistency coefficient was found as 0.84; Cronbach alpha internal consistency coefficient for the second factor was found as 0.82; Cronbach alpha internal consistency coefficient for the third factor was found as 0.77; Cronbach alpha internal consistency coefficient for the fourth factor was found as 0.64; Cronbach alpha internal consistency coefficient for the fifth factor was found as 0.61.

### **3.2.3. Split half-test reliability**

Split-half test technique was applied to the scale with a sample of 404 people, and as a result, Cronbach's alpha for the first half was found to be 0.85 and for the second half as 0.79 as well.

## **4. Conclusion and discussion**

In this research, it was objected to develop CMAS-CT attending the senior class student in the Faculty of Educational and to analyse psychometric properties of this scale. As a result of applied analyses and according to the results of EFA, it was found that CMAS-CT towards teacher candidates was in a five-factor structure. A 25-point scale with five factors explains 54% of the total variance. As a result of the CFA, it was seen that the structure of the five-factor was verified.

In reliability analyses of the scale, Cronbach's alpha internal consistency coefficient of the scale was found as 0.89. In the tests splitting process, alpha was found as 0.89 and for the second half, it was found as 0.79. It was observed that item-total correlations corrected in the total item correlation process ranged between 0.301 and 0.617. Furthermore, it can be seen that  $t$  (df = 216) values related to differences in 27% lower and higher groups' item scores range between 8.167 and 15.193, and that obtained  $t$  values are meaningful at 0.001 level.

In accordance with these results, it is concluded that CMAS-CT is a valid and reliable scale. This scale can be used by academicians to determine teacher candidates' classroom management anxiety. As a practical matter, the scale is considered to be beneficial for determining classroom management anxiety among teacher candidates and to take necessary measures by academician working in faculties of educational sciences and by practice teachers in schools.

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