

## Developing A Scale for Attitudes Toward the Measurement and Evaluation Course

### Ölçme ve Değerlendirme Dersine İlişkin Bir Tutum Ölçeği Geliştirme Çalışması

Nükhet Çıkrıkçı - Demirtaşlı  
Ankara Üniversitesi

#### *Abstract*

The purpose of the present study was to report the development of a new instrument to measure students' attitudes in pre-service teacher education towards an Educational Measurement and Evaluation course. The scale was applied to 242 undergraduate teacher education students from Ankara University and Hacettepe University, Ankara in Turkey. Results of factor analysis addressed the three dimensional constructs of the scale. The subscales showed high internal consistency: .92, .90, and .82. The internal consistency correlation of the total scale was .95.

**Key Words:** Measurement of attitudes, Attitudes towards Educational Measurement, Assessment in Teacher Education

#### *Öz*

Bu çalışmanın amacı, hizmet öncesi, öğretmenlik sertifikası öğrencilerinin ölçme ve değerlendirme dersine ilişkin tutumlarını ölçecek yeni bir ölçme aracını geliştirmektir. Bu amaçla ölçeğin deneme formu, Ankara ve Hacettepe Üniversitelerinin öğretmenlik sertifikası programlarına devam eden 242 öğretmen adayına uygulanmıştır. Ölçekten elde edilen verilere uygulanan faktör analizi işlemleri ölçeğin üç boyutlu olduğunu göstermiştir. Buna göre alt ölçekler yüksek iç tutarlık katsayıları olarak: .92, .90 ve .82 değerlerini vermiştir. Ölçeğin tümü için hesaplanan iç tutarlık katsayısı ise, .95 olarak hesaplanmıştır. Ölçek, bu konuda yapılacak araştırmalarda kullanılacak geçerli ve güvenilir bir araç görünümündedir. **Anahtar Sözcükler:** Tutumların ölçülmesi, Ölçme ve değerlendirmeye ilişkin tutum, Öğretmen eğitiminde değerlendirme

#### Introduction

The Educational Measurement and Evaluation course is a basic and prerequisite course for teacher certification program. Stiggins and Conklin (1988) estimated that teachers spend as much as a third of their professional time in assessment related activities and many of these activities require skills in testing and measurement (cited in Wise, Lukin and Roos, 1991). Some surveys of practicing teachers indicate that they realize the relevance of measurement training to their professional development (Plake, Impara and Fager, 1993; Wise, Lukin, and Roos, 1991).

On the other hand, the content of the Measurement and Evaluation course deals with statistics and mathematics. Observations as well as research results show that students in pre-service education who attend mathematics and statistics courses develop negative attitudes towards these courses because of their contents (Köklü, 1994; Conrad and Tracy, 1992; Wood, 1988; Kelly and Tomhave, 1985; Widmer and Chavez, 1982).

Previous studies related to teacher candidates' attitudes to measurement courses are limited in the literature (Bryant and Barnes, 1997; Üstün, 1992; Gullickson, 1984). On the other hand, there are some surveys of how faculty members, as educators for teacher candidates, feel about the requirement for an educational measurement course in training faculty members. The common finding of these surveys is that

the measurement course is accepted as a necessary course by faculty members in developing teaching skills (Toprak, 1999; Semerci, 1992). Demirtaşlı (1997) addressed this issue and suggested that faculty members needed training for techniques and methods in the assessment of student achievement. In this regard, Demirtaşlı (1998) surveyed the opinions of university students about problems faced in the assessment of their achievements by faculty members. The main findings of this study were that, according to the students' opinions, the majority of faculty members do not apply basic evaluation principles in assessment procedures and they fail to construct sufficiently valid and reliable exams.

The purpose of this study is to report the development and psychometric properties of a new Scale of Attitudes towards Educational Measurement and Evaluation Course (SAEM) in the teacher certification program. Anderson (1988) pointed out that if the future of attitudes is to be bright, several conditions must exist. Firstly, the importance of attitudes in relation to school learning must be realized. In certain conditions, attitudes are important as entry characteristics, as outcomes and as consequences (i.e. unplanned outcomes). Secondly, the precision with which people talk and write about attitude must be increased. Thirdly, attitude measurement of sufficient technical quality must be developed and used. Such measurements are necessary if the nature of attitudes in the field of education is to be better understood.

No studies to date are reported related to a measure of attitude toward educational measurement course for candidate teachers in Turkey. In this study, if this instrument is to be valid and reliable, the attitudes of pre-service teachers toward educational measurement and evaluation course should be identified and some arrangements suggested to increase course achievement should be suggested. Also, in the near future, this instrument should be able to be used by researchers to examine the relationship between achievement in the measurement course and attitudes towards this course.

#### Method

##### *Instrumentation*

Items for the SAEM were developed through consulting the literature (Bryant and Barnes, 1997),

expert opinions and personal observations. For collecting expert opinions, 41 statements which were written on cognitive, affective and behavioral components of attitude were presented with an evaluative checklist to the expert group, which included five people: two of whom were faculty members who have been teaching the Educational Measurement and Evaluation course, the other two were graduate students in the doctorate program of Educational Measurement and Evaluation and the last was an instructor in the Turkish language. The statements were evaluated for construct relevancy, appropriacy of language, expression, and attitude statements writing rules. After the examination of the expert ratings, some statements were rearranged and rewritten; all the statements were retained. The instrument was prepared as a five point Likert type questionnaire, with answers ranging from strongly agree (5) to strongly disagree (1). High scores indicate a positive attitude toward the course. About half of the 41 items were negative, while the other half were positive statements.

##### *Participants*

The SAEM was administered in Turkish to 242 students of the teacher certificate program at Ankara University and Hacettepe University. Students voluntarily participated in this study. Surveying was performed at the end of the academic term in regular class hours during the educational measurement and evaluation period. Each class had 40 or 50 students. The distribution of participants according to programs is given in Table 1.

#### Results

Table 1  
*Distribution of participants according to their programs.*

Department	<i>n</i>
Child Development	47
History	81
Mathematics	52
Language	3
Undetermined	55
Total	242

Exploratory factor analytical techniques were employed to identify the structure of the scale. All analyses were performed using SPSS 7.5 version. Principal axis factoring analysis yielded 7 factors with eigen values greater than one. Thirty-seven of the 41 items were loaded under factor 1, which explained 37.2 % of total variance. The remaining four items were collected under factor 6, factor 3, factor 2, and factor 7 respectively. Item 40 had an eigen value below .30. The factor loadings of items under each factor from this analysis are presented in Table 2.

As seen in Table 2, most of the items were loaded heavily under factor 1. The factor loadings of these items vary between .265 and .765. As stated in Tabachnick and Fidell (1996, 662), "none of the extraction techniques routinely provides an interpretable solution without rotation". For this purpose, varimax rotation was applied to the data. At the end of the varimax rotation, seven factors had eigen values greater than one; however screeplot suggested solutions ranging from three or four factors which can be seen in Figure 1.

Three and four factors were extracted. The three factor solution with varimax rotation was retained for interpretation. The structure and pattern coefficients from this analysis are presented in Table 3.

The first factor contained 18 items and was named as cognition of the importance of measurement in the teacher education program (because the items reflected

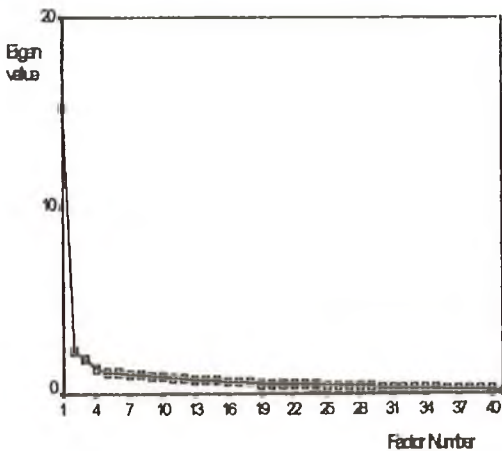


Figure 1. Scree plot of rotated factor

Table 2  
The Factor Structure of SAEM (Initial solution)

Item No.	Factor 1	Factor 2	Factor 3	Factor 6	Factor 7
1	.630				
2	.440				
3	.566				
4	.551				
5	.604				
6					.374
7	.532				
8	.480				
9	.575				
10	.558				
11	.552				
12	.626				
13	.573				
14	.575				
15	.608				
16	.629				
17	.662				
18				.582	
19	.755				
20	.740				
21	.636				
22	.744				
23	.658				
24	.384				
25	.683				
26	.587				
27	.591				
28	.707				
29	.732				
30	.595				
31			.400		
32	.750				
33	.765				
34	.708				
35	.577				
36	.753				
37	.692				
38	.607				
39	.614				
40	.265				
41	.435				
Eigen Value	15.26	2.32	1.85	1.14	1.05
Percent of Variance	37.2	5.7	4.5	2.8	2.6
cronbach alfa = .94					

Table 3  
Rotated Factor Structure (Varimax with Kaiser Normalization) and Factor Pattern Matrices

Item No.	Factor 1	Factor 2	Factor 3
1	.510		
2	.401		
9	.475		
12	.597		
15	.616		
16	.618		
18	.364		
20	.621		
21	.675		
22	.719		
23	.432		
24	.315		
33	.554		
34	.707		
36	.677		
37	.686		
38	.623		
39	.580		
3		.461	
5		.415	
7		.355	
8		.344	
10		.491	
11		.388	
19		.504	
25		.478	
26		.636	
27		.637	
28		.574	
29		.532	
31		.499	
32		.595	
41		.533	
4			.529
6			.486
13			.626
14			.410
17			.701
30			.516
35			.471
Rotations sums of squared loadings pct. of variance	19.88	13.00	10.51
Rotations sums of squared loadings cumulative pct.	19.88	32.88	43.39

candidate teachers' perceptions of the usefulness of measurement in teacher education program); the second factor had 15 items. It was affective, reflecting students' emotions to a measurement course. The third factor was named willingness to take more measurement courses and it comprises 7 items.

Internal consistency reliabilities for the subscales and total scale were .92, .90, .82 and .95. Interscale correlations ranged from .64 to .76.

### Discussion

The results of the present study provide support for the SAEM as a valid and reliable measure of preservice teachers' perceptions of the relevance of measurement to teaching, and their attitudes towards measurement course. The internal consistency reliability is quite satisfactory. In their development of inventory of attitudes towards educational measurement Bryant and Barnes (1997) found three subscales. Internal consistency reliabilities of their scale varied between .88 and .92; and its coefficient was .93 for total scores.

In the near future, this instrument can be used by researchers to examine the relationship between the measurement course's achievement and attitudes towards this course. If we provide these reliable and valid measurement devices, we can determine necessities and problems about teacher education programs. If a teacher education program's measurement curriculum can be made more relevant to teachers' work and teachers' attitudes towards formal measurement training can be improved then trainees will be likely to seek additional extensive training more willingly.

### References

- Anderson, L.W. (1988). Attitudes and their measurement. In J.P. Keeves, (Ed), *Educational research, methodology, and measurement: An international handbook*. New York: Pergamon Press.
- Bryant, N.C. & Barnes, L.L.B.(1997). Development and validation of the attitude toward educational measurement inventory. *Educational and Psychological Measurement*, 57 (5), 870-875.
- Conrad, K.S. & Tracy, D.M. (1992). Lowering pre-service teachers' mathematics anxiety through an experience-based mathematics methods course (*ERIC Document Reproduction Service No. ED 355 099*)
- Demirtaşlı-Çıkrıkçı, N. (1997). Üniversite öğretim üyelerinin öğreticilik meslek bilgisi sorunu: Ölçme ve değerlendirme boyutu *Eğitim ve Bilim Dergisi*, 21(104), 83-90.

- Demirtaşlı-Çıkrıkçı, N. (1998). Öğretmenlik sertifikası öğrencilerinin akademik başarılarının değerlendirilmesinde karşılaştıkları sorunlara ilişkin görüşleri. *Ankara Üniversitesi Eğitim Bilimleri Fakültesi Dergisi*, 31,(1), 67-90.
- Gullickson, A.R. (1984). Teacher perspectives of their instructional use of tests. *Journal of Educational Research*, 77(4), 244-248.
- Kelly, W.P. & Tomhave, W.K. (1985). A study of math anxiety/ math avoidance in per-service elementary teachers. *Arithmetic Teacher*, 3(50), 51-53.
- Köklü, N. (1994). Bir istatistik tutum ölçeğinin güvenilirliği ve geçerliliği. *Eğitim ve Bilim*, 18(9), 42-47.
- Plake, B.S., Impara, J.D. & Fager, J.J. (1993). Assessment competencies of teachers: A national survey. *Educational Measurement: Issues and Practice*, 6(1), 21-27.
- Semerci, C. (1992). *Firat Üniversitesinde öğrenci başarısının ölçülmesinde kullanılan yöntemler ile ölçme-değerlendirmeye ilişkin görüşler*. Yayımlanmamış yüksek lisans tezi, Fırat Üniversitesi Teknik Eğitim Fakültesi Eğitim Bilimleri Bölümü, Elazığ.
- Stiggins, R.J. & Conklin, N.F. (1988). *Teacher training in assessment*. Portland, OR, Northwest Regional Educational Laboratory.
- Tabachnick, B.G. & Fidell L.S. (1996). *Using multivariate statistics*. (3<sup>rd</sup> Ed.) NewYork: Harper Collins.
- Toprak, S. (1999). *Hacettepe Üniversitesi öğretim elemanlarının ölçme ve değerlendirmeye karşı görüşlerine ilişkin bir araştırma*. Yayımlanmamış yüksek lisans tezi, Hacettepe Üniversitesi, Sosyal Bilimler Enstitüsü, Ankara
- Üstün, S. (1992). *Hacettepe Üniversitesi öğretmenlik sertifikası hakkında öğrencilerin görüşleri ve tutumları*. Yayımlanmamış yüksek lisans tezi, Hacettepe Üniversitesi, Sosyal Bilimler Enstitüsü, Ankara.
- Widmar, C.C. & Chavez, A. (1982). Math anxiety and elementary school teachers. *Education*, 102, 272-276.
- Wise, S.L., Lukin, L.E. & Roos, L.L. (1991). Teacher beliefs about training in testing and measurement. *Journal of Teacher Education*, 42(1), 37-42.
- Wood, E.F. (1988). Math anxiety and elementary teachers: What does research tell us? *For the Learning of Mathematics*, 8(1), 8-13.

Geliş	30 Ekim 2001
İnceleme	20 Kasım 2001
Kabul	29 Mart 2002