Elementary Education Online, 12(3), 903-911, 2013.
İlköğretim Online, 12(3), 903-911, 2013. [Online]: http://ilkogretim-online.org.tr

Developing an Attitude Scale for Pre-Service Student Teachers' Material Usage in Classroom Environment

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ABSTRACT. The aim of this study is to develop a valid and reliable attitude scale in order to measure pre-service teachers' attitudes toward material usage in classroom environment. The study was carried out with 187 pre-service teachers from Fatih Faculty of Education at Karadeniz Technical University. Validity and assessment of the 33-item attitude scale was done with a pilot study. According to the results of the pilot study, a 5-point likert-type scale of attitude towards material usage in classroom environment, consisting of 20 items and two factors was developed and administered to 187 students, who formed the sampling. The alpha internal consistence coefficient that was calculated for the reliability of the scale was found to be 0,890.

Keywords: Material usage, attitude scale, pre-service teacher, teacher education

INTRODUCTION

Instructional materials play an important role in teaching and learning environments. They can be called as a tool, a source or equipment used to develop students' knowledge, skills, attitudes and values during instruction. They are mostly used to provide efficient and persistent learning and to concrete abstract concepts with visual elements (Şimşek, 2002; Tezici, Karaca & Sezginsoy 2008). Visual elements enlist students' interest, activate students, develop their creativeness, increase their success, give importance to students' individual learning, facilitate teaching in the lesson and give opportunity to organize the lesson beter. They also facilitate achieving curricular outcomes, make remembering the subjects easier, give opportunity to present knowledge in different ways, enable students to learn outside of the classroom by creating a new learning environment (Doğdu & Arslan, 1993; Gilbert, 1995; Yaşar, 2004).

Moreover, instructional material is an important factor in increasing quality of education. It is used as a tool to help teachers transfer their knowledge to students (Şahin & Yıldırım, 1999; Gündüz & Odabaşı, 2004; Yaşar, 2004). Teachers also use materials to set their own criteria as models of good assessment tasks for moderating their judgments. Teachers should be able to develop or use existing materials when they need. They could identify the quality of materials and be able to use them (Köseoğlu & Soran, 2006). However, if teachers have negative attitudes toward material usage, then the quality of the material has no importance (Noyes and Garland, 2005; Rajasekar and Philpose, 2008). It is a well known fact that Teacher attitudes can enhance or inhibit learning depending on whether they are positive or negative and teachers attitudes toward material usage is not an exception in this regard.

Triandis (1971) suggested that attitude consists of affective, cognitive, and behavioral components. The affective component of attitude is the emotion or feeling which includes statements of likes or dislikes about some certain objects. The cognitive component of attitude is statements of beliefs. In other words, an individual holds a belief that a certain object can significantly increase the quality of her/his output. And the behavioral component of attitude is what an individual actually does or intends to do (Morgan, 1991; Al-Khaldi & Al-Jabri, 1998 cited in Liwa, 2002, p. 19).

The user's attitude is an integral part of educational material usage in teaching, as attitudes influence not only students' or pre-service teachers' acceptance of material usage, but also their future behaviors

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regarding their material usage in their instruction (Selwyn, 1997; Fisbein & Ajzen, 1975 cited by Noyes & Garland, 2005, p. 234). There isn't any shortage of using instruments in assessing pre-service teachers' attitudes toward material usage in their teaching.

Primary education is fundamental for students. In primary school, students are not able to concretize abstract concepts in their minds. It is much easier to concretize abstract concepts by using materials. Thus, primary school teachers need materials for an effective teaching process. However, if a teacher has negative attitude toward material usage and do not use them, s/he will not benefit from the advantages of material usage in the learning and teaching process. So it is important to measure pre-service teachers' attitudes toward material usage in classroom environment and try to change their attitudes from negative to positive (Nuhoğlu & Yalçın, 2004; Wiske, *et al*., 1988; Köseoğlu & Soran, 2006).

As it is mentioned above, the purpose of this study was to develop and validate an attitude scale for pre-service teachers towards material usage. The developed attitude scale is going to be used to supply the relationship between positive and negative attitudes of pre service teachers towards material usage. With the help of this scale, researchers could determine pre-service teachers' reasons for developing negative attitudes towards material usage in classroom and with further studies they may try to propose ways to change these negative attitudes with positive ones which will contribute to enhance effective teaching and learning process.

METHOD

Participants

A sample of 187 students (pre-service teachers) from Karadeniz Technical University, Fatih Faculty of Education, Department of Primary Teacher Education participated in the study during the 2007-2008. Spring semester.

Development of Attitude Scale towards Material Usage

Development of an "Attitude Scale" has several steps and in this study, in order to develop a valid and reliable attitude scale to measure pre-service teachers' attitudes toward material usage, 5 major steps has been followed. These steps are summarized below:

Step 1. Literature Review: Existing attitude scales were investigated through a literature review of the items related to material usage in education. Some of the items were developed by the authors and some of them were obtained from literature.

Step 2. Scale Development: An attitude scale of 35 items (18 positive and 17 negative items) were developed for 5 point likert scal. Points are labeled as "strongly agree (5 points), agree (4 points), undecided (3 points), disagree (2 points) and strongly disagree (1 points)".

Step 3. Review of Field Experts: Pilot attitude scale's content validity, clarity, ambiguity, generality of attitude items were consulted by six experts [Department of Computer Education and Instructional Technology (2 experts), Department of Primary School Education (4 experts)]. At the end of the review of the field experts 2 items were eliminated and 8 items were modified.

Step 4. Application: The attitude scale was administered to 187 primary school pre-service teachers.

Step 5. Analysis of the items: Statistical package program (SPSS 15.0 for windows) was used for the analyses. The validity of the scale was tested by factor analysis and its reliability was proved by Cronbach Alpha Technique. The final attitude scale which was developed to measure attitudes of pre-service teachers toward material usage in classroom is displayed on Table1

Table 1. *Attitude scale towards material usage*

	Dear Student, The purpose of this scale is to determine pre-service teachers' attitude towards material usage. There is no right or wrong answers in this scale. Please, mark the blank that represent your stance towards each item in the scale. Thanks for your contribution.	**Strongly Agree**	**Agree**	**Undecided**	**Disagree**	**Strongly Disagree**
1	I like using materials in lessons					
2	I think that using materials in lessons requires extra time and work load					
3	I don't think all of the subjects can be taught by using materials					
4	I believe that using educational materials during lecture is essential.					
5	I don't think that our classrooms have the necessary infrastructure for using materials.					
6	I believe that the students will be more active in the lessons with the use of materials.					
7	I think that using materials in lessons is limiting students' creativity.					
8	I believe that students' success will increase with use of materials.					
9	I feel uncomfortable while lecturing with materials.					
10	I believe that the usage of materials is important because it enables experiments which cannot be done in laboratories					
11	I think that the use of materials do not address students' individual differences					
12	I think that teaching without using materials is more effective.					
13	I believe that developing materials is a waste of time.					
14	I believe that using materials in the lessons will increase permanent (persisstant) learning.					
15	I believe that using materials in lessons facilitates lecturing.					
16	I believe that it is difficult to control classroom in the material used lectures.					
17	I don't believe that material usage has a positive effect on learning.					
18	I think that it is necessary to search from different sources for developing materials.					
19	I enjoy material development process.					
20	I think that using materials misleads students away from real target by keeping them busy					
21	I think that I organize the lesson better when I use materials.					
22	I believe that using materials has no effect on relating the subject to daily life.					
23	I think that use of materials in lessons enlists students' interests					
24	I have difficulty in taking attention of students in the lessons which I use materials.					
25	I believe that using materials facilitates achieving curricular outcomes.					
26	I think that class hour is not enough for using materials.					
27	I think that it is easier to remember subjects/concepts/lessons which are taught by using materials.					
30	I believe that use of materials provides presenting the knowledge in different ways.					
31	I think that use of materials enables students to learn outside of the					

	classroom by creating a learning environment.
32	I am afraid of misusing materials.
33	I think that students rather remember the materials instead of the subject in the material used lectures.

RESULTS

The 5-point Likert-type scale, which was prepared by the field expert, was administered to 187 pre-service teachers (undergraduate students) and their answers were collected. Factor analysis was performed on the collected data. At the end of the first analysis, a scale of 33 items and 9 factors was emerged. After the evaluation of the factor analysis results, the items with factor loading below 0, 40 were decided to be omitted from the analysis. Special emphasis was given to the difference between the factor loading values and loading values taken from the other factors to be 0,10 (Büyüköztürk, 2007). Considering these values, some items were removed from the analysis and the second analysis was made. The results are displayed on Table 2.

Table 2. *The factor analysis results of the attitude scale of 20 items*

Item No	***Factor Loading Value***	***Communalities***	***Item Total Correlation***
1	*0,612*	*0,377*	*0,545*
4	*0,615*	*0,379*	*0,547*
8	*0,592*	*0,427*	*0,498*
9	*0,495*	*0,433*	*0,423*
13	*0,514*	*0,381*	*0,468*
14	*0,674*	*0,470*	*0,595*
15	*0,655*	*0,510*	*0,564*
16	*0,404*	*0,318*	*0,381*
18	*0,632*	*0,401*	*0,561*
20	*0,694*	*0,524*	*0,646*
21	*0,688*	*0,474*	*0,623*
23	*0,508*	*0,394*	*0,414*
24	*0,581*	*0,462*	*0,554*
25	*0,562*	*0,593*	*0,446*
26	*0,483*	*0,356*	*0,340*
27	*0,714*	*0,602*	*0,620*
28	*0,687*	*0,496*	*0,602*
29	*0,713*	*0,574*	*0,674*
30	*0,745*	*0,569*	*0,664*
32	*0,508*	*0,364*	*0,311*
Reliability Coefficient (Alpha)= 0,890			

After the second factor analysis, the first factor loading values for 20 items were found to be above 0,400. And, no values were found to be close to the item's first factor loading value. The alpha internal consistence coefficient that was calculated for the reliability of the scale of attitudes towards material usage was found 0,890. The total correlations of 20 items were calculated for the item differentiation and difficulty, and they were found to be changing between 0,311 and 0,674. Table 3 presents the total variance results of the attitude scale at the end of the factor analysis, before and after rotation.

Table 3. *The component matrix values of the attitude scale before and after rotation*

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	Variance (%)	Cumulative (%)	Total	Variance (%)	Cumulative (%)	Total	Variance (%)	Cumulative (%)
1	7,14	35,70	35,70	7,14	35,70	35,70	5,55	27,75	27,75
2	1,96	9,80	45,51	1,96	9,80	45,51	3,55	17,76	45,51

It could be seen that the initial values of 20 items were cumulated under two factors greater than 1 from the tables. The variance explained by these two factors was 45,51%. The two defined factors according to the items had a common variance between 0,318 and 0,602. Therefore, the two factors that emerged as important factors in the analysis, together explained most of the total variance in the items and the scale. The first factor of the constructed attitude scale explained the 27,75 %, and the second, 17,76 % total variance of the scale. The common variance that the two factors explained on the items was 45,51 %. The component matrix values before and after the rotation are shown on Table 4.

Table 4. *The component matrix values of the attitude scale before and after rotatio*

Items	*Component Matrix*	*Rotated Component Matrix*	
		1	*2*
27	*0,714*	*0,762*	
25	*0,562*	*0,759*	
15	*0,655*	*0,703*	
30	*0,745*	*0,686*	
28	*0,687*	*0,658*	
8	*0,592*	*0,646*	
14	*0,674*	*0,631*	
23	*0,508*	*0,627*	
21	*0,688*	*0,58*	
18	*0,632*	*0,551*	
1	*0,614*	*0,539*	
4	*0,615*	*0,523*	
9	*0,434*		*0,652*
24	*0,581*		*0,616*
29	*0,713*		*0,609*
32	*0,325*		*0,603*
26	*0,351*		*0,596*
13	*0,514*		*0,569*
20	*0,694*		*0,55*
16	*0,404*		*0,551*

The component matrix table showed that the first factor loading values of all 20 items were bigger than 0,40. Another proof of the existence of a general factor was that the variance caused by the first factor loading value before rotation was 35,70 %. Examined rotated component matrix results were provided definition of two factors. The line graph is given in Figure 1.

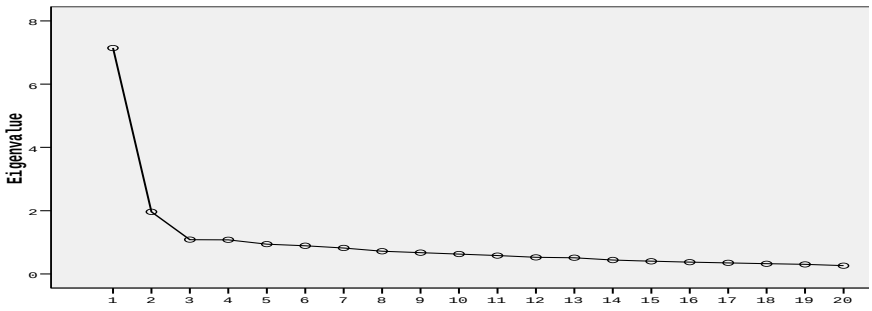

Figure 1: The line graph of attitude scale consisting of 20 items

In line graph the vertical axis shows eigenvalues and horizontal axis shows factors. When the factors are matched with eigenvalues some plots have been seen. Graph is obtained with combining these plots. High acceleration, rapid decrease in a factor gives number of important factors. In the analysis of the important factor number was defined to be 2 according to the initial value. This situation could be clearly seen in the line graph drawn according to the initial value. In Graph-1, a high curved decrease was observed after the first factor. This situation showed that the scale could have a general factor. Besides, after the 2nd factor, a less curved decrease could be observed; therefore, it could be thought that the scale has two factors.

According to this; the titles has been grouped under 2 factors. These are:
(1) attitudes towards material usage in classroom environment,
(2) material implementation
The items involved in these titles and their factor-structure coefficients are given in Table 5.

Table 5. *Items and related factors*

Item No	Items
1. Material Implementation	
1	I like using materials in lessons
4	I believe that using educational materials during lecture is essential.
8	I believe that students' success will increase with use of materials.
14	I believe that using materials in the lessons will increase permanent learning.
15	I believe that using materials in lessons facilitates lecturing.
18	I think that it is necessary to search from different sources for developing materials.
21	I think that I organize the lesson better when using materials.
23	I think that use of materials in lessons enlists students' interest
25	I believe that using materials facilitates achieving curricular outcomes.
27	I think that it is easier to remember subjects/concepts/lessons which is taught by using materials
28	I think that use of materials is essential to intensify subjects learnt in the lesson.
30	I believe that use of materials provides presenting the knowledge in different ways.
2. Attitudes Towards Material Usage In Classroom Environment	
9	I feel uncomfortable while lecturing with materials.
13	I believe that developing materials is a waste of time.
16	I believe that it is difficult to control classroom in the material used lectures.
20	I think that using materials misleads real target by keeping student busy
24	I have difficulty in taking attention of students' in the lessons which I use materials.
26	I think that lecture hour is not enough for using materials.
29	I think that use of materials in the lecture limits lecturer.
32	I am afraid of misusing materials.

As seen Table 5, the 27th, 25th, 15th, 30th, 28th, 8th, 14th, 23rd, 21st, 18th, 1st and 4th items were found to be in factor "material implementation" and the 9th , 24th, 29th , 32nd , 26th , 13th , 20th, 16th were found to be in factor "attitudes towards material usage in classroom environment".

DISCUSSION and CONCLUSIONS

In this study, a 5-point Likert-type attitude scale towards material usage in classroom environment consisting of 20 items and two is developed and administered to 187 pre-service teachers. The alpha internal consistence coefficient that was calculated for the reliability of the scale of attitudes toward material usage was found to be 0,890.

Material usage in lessons in the primary schools is very important in order to enable primary school students to concretize abstract concepts, to assist their learning process, make it easier for them to remember new information, to encourage their involvement, to increase their self-esteem, to be cognizant of individual student differences, to provide a useful set of underlying theoretical principles that focus and enhance the characteristics of the planning and the pedagogies for learning (Conners, Nettle & Placing, 1990).

It is important to be aware of pre-service teachers' attitudes towards material usage so that courses related to this area could be organized to draw the attention of pre-service teachers (Nuhoğlu & Yalçın, 2004). As Erden (1995) mentioned is his study; before changing pre-service teachers' attitudes, one must find out the factors that leads to the forming and developing of these attitudes. If an individual does not pay attention to one area, it is unexpected that person will learn something and teach about this area (Kaya Şengören, Tanel & Kavcar, 2007).

The attitude scale developed with this study is used to measure pre-service primary school teachers', attitudes toward material usage in class. The same scale can be improved or modified in the future to measure other field teachers' attitudes or to determine pre-service teachers' reasons for using or not using instructional materials in their teaching process.

SUGGESTIONS

As it is mentioned above, this scale is developed for pre-service teachers and applied to pre-service primary school teachers. After assessing its validity and reliability for other field teachers, it might be applied to pre-service teachers in other educational programs. This attitude scale was administered to a limited number of pre-service teachers and only in the Spring semester. It would be highly beneficial if this scale can be applied to all students in the faculty of education and twice in an academic year: first in the beginning of the year, and second before the end of the year. Some courses could be added to curriculums of the faculty of education in order to enable students to develop positive attitudes toward material usage. Practice courses could be given to improve material usage skills of pre-service teachers. It can be concluded that this attitude scale can be used in future studies to measure attitudes of teachers toward material usage in lectures and to change negative attitudes ith positive ones.

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Öğretmen Adaylarının Sınıf Ortamında Materyal Kullanımına Yönelik Tutum Ölçeği Geliştirilmesi

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ÖZ: Bu çalışmanın amacı, öğretmen adaylarının sınıf ortamında materyal kullanımına yönelik tutumlarını ölçecek geçerli ve güvenilir bir tutum ölçeği geliştirmektir. Çalışmanın örneklemini Karadeniz Teknik Üniversitesi Fatih Eğitim Fakültesinde öğrenim gören 187 öğretmen adayı oluşturmaktadır. Çalışmada 33 maddelik bir tutum ölçeği geliştirilerek, ölçeğin geçerlik ve güvenirlik çalışması yapılmıştır. Çalışmanın sonunda materyal kullanımına yönelik 20 madde ve 2 faktörden oluşan 5'li likert tipi tutum ölçeği geliştirilmiştir. Materyal kullanımına yönelik geliştirilen tutum ölçeğinin alfa iç tutarlılık katsayısı 0,890 olarak bulunmuştur.

Anahtar Kelimeler: Materyal kullanımı, tutum ölçeği, öğretmen aday, öğretmen eğitimi

ÖZET

***Amaç ve Önem*:** Öğretim materyalleri eğitimin niteliğini artıran önemli faktörlerdendir. Öğretmenlerin bilgilerini öğrencilere aktarmada onlara yardımcı olarak kullanılmaktadır (Şahin & Yıldırım, 1999; Gündüz & Odabaşı, 2004; Yaşar, 2004). Öğretmenler ayrıca materyalleri kendi kriterlerini oluşturmada, model oluşturmada, ders anlatımını kolaylaştırmada, soyut kavramları somutlaştırmada sıklıkla kullanmaktadır. Öğretmenler ihtiyaçları olduğunda kendi materyallerini geliştirme veya ellerinde var olan materyalleri kullanabilme yeterliğine sahip olmalıdır. Materyal ne kadar iyi olursa olsun eğer onu kullanacak olan öğretmenin materyal kullanmaya karşı olumsuz bir tutumu varsa, öğretmen onu kullanmayacaktır. Bu nedenle yarının öğretmenleri olan öğretmen adaylarının sınıf ortamında materyal kullanmaya yönelik tutumlarını belirlemek ve bu tutumlarını olumlu yöne çevirmek önemli olmaktadır (Nuhoğlu & Yalçın, 2004; Wiske, et. all., 1988; Köseoğlu & Soran, 2006). Bu çalışmanın amacı öğretmen adaylarının sınıf ortamında materyal kullanımına yönelik tutumlarını ölçecek geçerli ve güvenilir bir tutum ölçeği geliştirmektir.

Yöntem: Çalışmanın örneklemini Karadeniz Teknik Üniversitesi Fatih Eğitim Fakültesinde öğrenim gören 187 öğretmen adayı oluşturmaktadır. Araştırmacılar tarafından sınıf ortamında materyal kullanımına yönelik literatür incelenerek 35 tutum maddesi hazırlanmıştır. Hazırlanan bu maddeler 6 uzaman tarafından incelenmiştir. Uzman görüşüne göre ölçeğin iki maddesi ölçekten çıkartılmış, sekiz maddesi de değiştirilmiştir. Ölçek düzenlenerek 187 sınıf öğretmen adayına uygulanmıştır.

Bulgular: Sınıf öğretmen adaylarına uygulanan ölçeği faktör analizi yapılmıştır. Yapılan ilk faktör analizi sonucunda 33 madde ve 9 faktörden oluşan 5'li likert tipinde bir ölçek elde edilmiştir. Daha sonra faktör analizi sonuçları değerlendirilmiş ve faktör yükü 0,40'ın altında olan maddeler ölçekten çıkartılmıştır. İkinci faktör analizinden sonra faktör yükü 0,4'ün üzerinde olan 20 maddelik bir ölçek elde edilmiştir. Materyal kullanımına yönelik tutum ölçeğinin güvenirliği için hesaplanan alfa iç tutarlılık katsayısı 0,890 olarak bulunmuştur. Ölçeğin 20 maddesinin toplam korelasyonu madde ayırt ediciliği ve madde güçlüğü için hesaplanmıştır ve değerlerinin 0,311 ve 0,674 arasına yer aldığı görülmüştür.

Tartışma, Sonuç ve Öneriler: Çalışmanın sonunda materyal kullanımına yönelik 20 madde ve 2 faktörden oluşan 5'li likert tipi tutum ölçeği geliştirilmiştir. Materyal kullanımına yönelik geliştirilen tutum ölçeğinin alfa iç tutarlılık katsayısı 0,890 olarak bulunmuştur. Öğretmen adaylarının derslerinde materyal kullanmaya yönelik tutumlarını bilmek önemlidir. Tutumları bilinirse dersler onların olumsuz tutumlarını olumlu hale getirme yönünde düzenlenebilir. Elde edilen ölçeğin öğretmen adaylarının gelecekte yapacakları öğretimde materyal kullanma ve kullanmama durumlarını belirlemede kullanılabileceği düşünülmektedir.

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