

ATTITUDES OF PRE-SERVICE TEACHERS FROM THE DEPARTMENT OF ELEMENTARY EDUCATION TOWARDS THE EFFECTS OF MATERIALS USE ON LEARNING

Assist. Prof. Dr. Şendil CAN
Muğla University, Faculty of Education
Department of Elementary Education
sendilcan@hotmail.com

ABSTRACT

In line with the fast advance seen in technology, the use of technological resources in education has come to play an important role in terms of drawing students' attention to the subjects studied in the classroom so that success increases and the knowledge is better internalized.

This study was carried out to determine the attitudes of the pre-service teachers from the department of elementary education towards the effects of use of teaching materials; overhead projector and projector; on learning. The study was carried out with 184 senior pre-service teachers, 32 of whom are from the department of science teaching, 70 are from the department of classroom teaching, 46 are from the department of pre-school teaching and 36 are from the department of social studies teaching. The data obtained from the questionnaire used in the study were analyzed through SPSS program package. Independent t-test was used to test whether there is a significant correlation between the pre-service teachers' responses and gender and their background. In addition, One-Way ANOVA was used to test whether there is a significant correlation between student teacher' responses and their departments and some differences are detected with regards to the effects of using overhead projector and projector on learning.

According to the findings of the study, the students are found to believe that the use of overhead projector and projector brings some kind of change and variety to the teaching, saves teaching from being monotonous, and contribute to establishing lively, colorful and smooth setting for teaching and learning.

Key Words: Teaching Technologies, Use of Material, Overhead Projector and Projector, Student Attitudes, T-Test, One-Way ANOVA

INTRODUCTION

We are living in an era where rapid changes are experienced in information exchange and technology at a global scale, information is multiplied, a novel technology appears in every passing day, and there is a challenging environment of competition among countries (MEB, 2000). The most important issue of this century is education and technological advancements. Rapidly developing information and educational technologies¹ have affected education in general and become the indispensable part of any educational endeavors. The use of radio, TV, video and overhead projector for educational purposes date back to third quarter of 20th century and in today's world, the most important advancement affecting the development and quality of education institutions is the computer, internet, and associated technologies. (Middlehurst, 1999; 307; cited in : İspir et al., 2007). Rıza (1999) emphasizes that educational technologies make great contributions to the creativity together with special objectives, text books, methods, tools and equipment, and evaluation and assessment. As a result of technological developments in today's world, new possibilities have been integrated into educational practices and thus the methods and settings have been enhanced (Koşar and Çiğdem, 2003). Existing research indicates that when used appropriately, technology can enhance the learning environment and students' motivation and also may improve their retention, problem solving and critical thinking skills (Yıldırım, 2000).

For students to better understand what they are taught, it is of great importance to use more educational tools in the classroom setting. In today's classroom setting, visual and audio materials are viewed to be very important. For visual and audio materials to be used effectively, there is a need to know the properties of these materials. These properties may seem to be very simple but have a great impact on the quality of the lesson (Küçükahmet, 1999). Some studies reported that the appropriate and conscious use of these materials such as overhead projector and projector may have very positive impacts on learning (Ayvacı et al., 2007). In this respect, creating teaching settings where various visual and audio teaching materials addressing as many senses as possible is of great importance for long-lasting learning to occur (Dursun, 2006; cited in: Fidan, 2008). In this way, the

¹ Educational technology is a complex and an integrated process dealing with people, procedures, methods, opinions, tools and organizations to analyze learning-related problems, find solutions, manage the solution, implement the solution and evaluate the outcomes.

students can achieve the determined objectives more easily with the help of effective learning teaching environment.

Research concerning the application of different dimensions of educational technologies for teaching has revealed that such applications have multi-dimensional positive impacts on students' achievement. In this respect, various teaching materials (game, anthology, sample situation, experiment, model) (Aktamış et. al., 2002), teaching through modeling (Şahin et. al., 2001), and computer-assisted materials (Akdeniz & Yiğit, 2001; Kibos, 2002; Yumuşak & Aycan, 2002) were found to enhance students' achievement.

Teaching tools can provide real experiences that can not be easily provided by other methods. Thus, these tools can enhance the quality of learning and internalization and can bring variety (Özkütük & Orgun, 2001). Students' having positive or negative attitudes towards educational tools and devices is an important variable affecting the use of technology in class. Hence, it is important to determine students' attitudes towards technological materials because this will help to develop better educational policies and strategies for the use of such materials. Therefore, there is a need for studies aiming to determine students' attitudes towards technological materials. In recent years, more importance has been attached to this issue and various studies have been carried out.

Akpınar et. al., (2005) investigated the students' attitudes towards the use of technology in science course in elementary education and the extent to which the teachers use technological materials in science courses. The results they obtained revealed significant differences between state and private schools and that there are significant differences depending on the school type among the students' attitudes towards the extent to which technology is used.

Frantom et. al., (2002) investigated the children's attitudes towards technology and they obtained two-factor scale including interest, talent and alternative properties. In these two sub-scales, when the scores of elementary and secondary school students were compared, significant difference was found. Moreover, they reported that attitude varies depending on gender.

Dalton & Hannafin (1986) investigated the effects of video, computer-assisted teaching, and interactive video applications on learning performance and attitude and they found that the computer-assisted teaching is the most effective teaching system and there is no need for additional interactive videos. Moreover, when interactive video teaching was compared with computer-assisted teaching and video, it was found that it significantly affects the attitudes of students with low level of competency (cited in: Yavuz and Coşkun, 2008).

Gunter, Gunter & Wiens (1998) investigated the effects of working with computer in the technology education course of a university in Florida on pre-service teachers' attitudes towards learning. They reported that after they completed their course studies, the students had more positive attitudes towards technology and felt more confident about the use of technology.

Yılmaz (2005) evaluated the effects of technology use on students' achievement and attitudes in a thesis work, and found that technological materials have positive impacts on achievement and attitudes.

A similar study was carried out by Sevindik (2006), who investigated the effects of the use of smart classes on students' academic achievement and attitudes at higher education.

Asan (2002) investigated the attitudes of the pre-service teachers having science and social studies teacher training towards the computer. The findings of the study in general revealed that the students have positive attitudes towards the computer and they felt comfortable while using computer. While the attitudes of the students from the department of science teaching who did not have computer education have more positive attitudes than the students from the department of social studies teaching towards the computer, no significant department-based difference was found between the students having computer courses. No significant impact of gender on attitudes was observed. The results revealed that computer-related experiences have positive impacts on attitude scores.

It is believed that determination of students' attitudes who are in the center of learning and teaching process towards teaching technologies² and putting emphasis on the importance of this issue will have contributions to education in general. Using different technological possibilities besides classical ways of teaching in teaching

² Teaching technology is a unity of academic systems to enhance the effective design of teaching and learning process, to solve the problems encountered in teaching and learning process and improve the quality and retention of the information presented (İşman, 2002).

process will have consolidating impacts. With the use of teaching technologies, students are believed to be more attentive to their lessons and willing to actively participate in them. According to many researchers, teaching technologies used effectively have a potential to improve education system (Jonassen & Reeves, 1996; Means, 1994). The present study aims to determine the attitudes of pre-service teachers from the department of elementary education towards the effects of two educational materials, overhead projector and projector, on learning. Answers to the following sub-research questions are sought by the present study:

- Is there a significant difference between the attitudes of male and female pre-service teachers towards the effects of using overhead projector and projector on learning?
- Is there a department-based significant difference among the attitudes of the pre-service teachers towards the effects of using overhead projector and projector on learning?
- Is there a significant difference among the attitudes of the pre-service teachers towards the effects of use of overhead projector and projector on learning depending the environment they were brought up?

METHOD

In the present study, survey method was employed. Survey method is a method used to describe and explain what events, objects, institutions, groups and various fields are.

Sample

The study was carried out among 184 last year pre-service teachers from the departments of science teaching, classroom teacher education, pre-school teacher education, and social studies teaching of the education faculty of Muğla University in 2004-2005 spring term.

Data Collection

As a data collection instrument, 5-point Likert Type scale aiming to solicit the pre-service teachers' attitudes towards the effects of using overhead projector and projector on learning and a personal information form developed by the researcher to solicit the demographic features of the participants were used. The reliability of the scale was calculated with Cronbach Alpha coefficient formula in SPSS 10.0 program package and was found to be .93. This proves that the scale is reliable and administrable. For the validity of the scale, expert opinions were sought to confirm that the items in the scale measure the target attitudes. The scale consists of 16 items to solicit the students' attitudes towards the effects of using overhead projector and projector on learning. There are five points in this scale representing "Strongly agree", "Agree", "Undecided", "Disagree", and "Strongly Disagree" options. As all the items in the scale are positive, scoring is performed from 5 to 1.

Data Analysis

The data obtained were analyzed through SPSS 10.0 program package. Independent t-test was used to test whether the attitudes significantly vary depending on gender and their background. In addition, One-Way ANOVA was used to test whether there is a significant difference among pre-service teachers' attitudes depending on the department variable.

FINDINGS AND DISCUSSIONS

Findings are presented according to above-given order of the research questions.

Findings Concerning the First Sub-question

The first sub-question of the study is "Is there a significant difference between the attitudes of male and female pre-service teachers towards the effects of using overhead projector and projector on learning?" To present the answer to this question, first, frequencies and percentages of the distribution of the students according to their gender and their attitudes towards the effects of using overhead projector and projector on learning according to gender are given.

Table 1: Distribution of the Pre-service Teachers According to Gender

Gender	Frequency	Percentage
Female	107	58.2
Male	77	41.8
Total	184	100.0

58.2% of the participants are female and 41.8% are male thus majority of the sampling consists of females.

Table 2: Distribution of Pre-service Teachers' Responses to the Scale Items According to Gender

Item	Strongly Agree		Agree		Undecided				Disagree		Strongly Disagree									
	Female		Male		Female		Male		Female		Male		Female		Male					
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%				
1	58	54.2	41	53.2	45	42.1	31	40.3	2	1.9	3	3.9	1	.9	2	2.6	1	.9	-	-
2	48	44.9	34	44.2	52	48.6	33	42.9	5	4.7	6	7.8	2	1.9	4	5.2	-	-	-	-
3	42	39.3	35	45.5	56	52.3	31	40.3	8	7.5	6	7.8	1	.9	5	6.5	-	-	-	-
4	36	33.6	21	27.3	56	52.3	44	57.1	10	9.3	9	11.7	4	3.7	3	3.9	1	.9	-	-
5	35	32.7	28	36.4	59	55.1	37	48.1	10	9.3	9	11.7	3	2.8	3	3.9	-	-	-	-
6	30	28.0	23	29.9	54	50.5	34	44.2	18	16.8	15	19.5	5	4.7	5	6.5	-	-	-	-
7	52	48.6	34	44.2	51	47.7	35	45.5	1	.9	4	5.2	2	1.9	3	3.9	1	.9	1	1.3
8	33	30.8	27	35.1	54	50.5	39	50.6	14	13.1	9	11.7	6	5.6	2	2.6	-	-	-	-
9	30	28.0	22	28.6	51	47.7	40	51.9	18	16.8	6	7.8	8	7.5	9	11.7	-	-	-	-
10	48	44.9	29	37.7	36	33.6	22	28.6	6	5.6	10	13.0	9	8.4	10	13.0	8	7.5	6	7.8
11	34	31.8	23	29.9	56	52.3	41	53.2	5	4.7	5	6.5	-	-	2	2.6	-	-	-	-
12	39	36.4	29	37.7	63	58.9	41	53.2	5	4.7	5	6.5	-	-	2	2.6	-	-	-	-
13	43	40.2	33	42.9	59	55.1	34	44.2	2	1.9	6	7.8	2	1.9	4	5.2	1	.9	-	-
14	44	41.1	35	45.5	56	52.3	33	42.9	6	5.6	5	6.5	1	.9	4	5.2	-	-	-	-
15	34	31.8	24	31.2	58	54.2	34	44.2	10	9.3	9	11.7	3	2.8	9	11.7	2	1.9	1	1.3
16	39	36.4	29	37.7	49	45.8	36	46.8	13	12.1	7	9.1	5	4.7	5	6.5	1	.9	-	-

Statements given in Table 2 with numbers are presented below:

1. Using overhead projector and projector in class draws my attention.
2. Lessons taught with overhead projector and projector arouse my interest and curiosity.
3. In lessons presented with overhead projector and projector, I can better understand difficult and abstract topics and concepts and visualize them in my mind.
4. In lessons presented with overhead projector and projector, learning takes place in a shorter time span.
5. Using overhead projector and projector in lessons makes it easier to encode the information in my mind.
6. When overhead projector and projector are used in lessons, light, color, movement and sound features help me to constantly focus my attention on the information presented.
7. Using overhead projector and projectors in lessons makes teaching more lively and clear by bringing variety and change.
8. Using overhead projector and projector in lessons enables me to physically and cognitively participate in learning process.
9. Using overhead projector and projector in lessons allows me to be exposed to enriched information.
10. I prefer lessons to be taught with overhead projector and projector to lessons taught with traditional chalk and black board.
11. Using overhead projector and projector in lessons helps me to retain the information longer.
12. Using overhead projector and projector in lessons makes learning more effective and efficient.
13. Using overhead projector and projector in lessons allows me to observe the objects, phenomenon and events which are impossible to bring to classroom environment.
14. Using overhead projector and projector in lessons eliminates the monotony in class and provides colorful, lively and interesting learning-teaching environment.
15. Using overhead projector and projector in lessons makes me willing to learn.

16. Using overhead projector and projector in lessons helps me to feel motivated and maintain this motivation throughout the lesson.

When Table 2 is examined, it is seen that both the male students and female students believe that using overhead projector and projector in lessons has positive impacts on learning processes. The most positive attitude is revealed by the students towards item 12 (58.9%) (*Using overhead projector and projector in lessons makes learning more effective and efficient*). This is followed by items 4 (*In lessons presented with overhead projector and projector, learning takes place in a shorter time span*), 5 (*Using overhead projector and projector in lessons makes it easier to encode the information in my mind*) and 13 (*Using overhead projector and projector in lessons allows me to observe the objects, phenomenon and events which are impossible to bring to classroom environment*).

The use of technological devices such as computer, overhead projector, projector, television, DVD, VCD, microscope, and tape recorder which are popular to use in the classroom for educational purposes have been found to have many positive effects on teaching and learning process. In the present study, technological materials were found to make lessons more effective and efficient, and more interesting, help students to encode the information more easily in their minds and allow students to observe the objects, phenomenon and events which are impossible to bring to classroom environment. In addition, these technological devices should be used properly and appropriately, they are important to support visual learning and save time. These findings of the study concur with the findings reported in the literature (Gunter, Gunter & Wiens, 1998; Yılmaz, 2005; Sevindik, 2006; Pala, 2006).

T-test was used to determine whether there are significant differences between the attitudes of female students and those of the male students towards the effects of using overhead projector and projector on learning and findings are presented in Table 3.

Table 3: T-Test Results Concerning the Distribution of Scale Scores According to Gender

Gender	f	\bar{X}	S	df	t	p
Female	107	67.26	8.11	182	.70	.49
Male	77	66.31	10.29			

The results presented in Table 3 show that there is no significant difference between the attitude scores of the female students and those of the male students [$t_{(182)} = .70, p > .05$]. Yet, the attitudes of female students ($\bar{X} = 67.26$) were found to be more positive than those of the male students ($\bar{X} = 66.31$). Moreover, attitude scores obtained for each scale item were also analyzed to determine whether they individually exhibit significant differences according to gender and no significant difference was observed. These findings comply with the findings of (İspir et. al., (2007) and Yavuz and Coşkun (2008).

Findings Concerning the Second Sub-question

The second question of the study is “Is there a department-based significant difference among the attitudes of the pre-service teachers towards the effects of using overhead projector and projector on learning?” First, the distribution of the students according to subject area is presented in Table 4 and then one-way ANOVA was used to test whether there are significant differences among the students’ attitudes towards the effects of using overhead projector and projector on learning according to the department they attend and the findings are presented in Table 5 and Table 6.

Table 4: Distribution of the Pre-service Teachers According to Department

Department	Frequency	Percentage
Science teacher education	32	17.4
Classroom teacher education	70	38.0
Pre-school teacher education	46	25.0
Social sciences teacher education	36	19.6
Total	184	100.0

The data presented in Table 5 show that 17.4% of the students are from the department of science teaching, 38.0% of them from the department of classroom teacher education, 25.0% are from the department of pre-school teacher education and 19.6% are from the department of social studies teaching.

Table 5: Arithmetic Means and Standard Deviations of the Students According to Department

Department	N	\bar{X}	S
Science teacher education	32	4.43	.51
Classroom teacher education	70	4.11	.49
Pre-school teacher education	46	4.26	.54
Social sciences teacher education	36	3.98	.70
Total	184	4.18	.57

Table 6: ANOVA Results Concerning the Distribution of Attitude Scores According to Department

Source of the variance	Total Square	df	Mean squares	F	p
Inter-groups	4.05	3	1.35	4.44	.00*
Intra-groups	54.80	180	.30		
Total	58.86	183			

p < .05 * A significant difference exists

In table 5, it is seen that there are differences among the arithmetic means. Results of ANOVA test conducted to determine whether these differences are statistically significant are presented in Table 6 and they indicate that there are significant differences among the students' attitudes according to their departments [$F_{(3-180)} = 4.44$, $p < .05$]. That is, the attitudes of pre-service teachers significantly vary depending on the department attended. In order to find out between which departments this significant difference occurs, Scheffé test was conducted. Scheffé test results revealed that scale scores of the pre-service teachers from the department of science teaching ($\bar{X} = 4.43$) are more positive than those of the pre-service teachers from the department of social studies teaching ($\bar{X} = 3.98$). This finding concurs with the findings of Asan (2002). Moreover, whether attitude scores significantly vary for each item in the scale according to the department was also tested, and significant department-based differences were found for the items 3, 4, 6, 10, 11, 12, 13, 14 and 15 ($p < .05$). This difference being in favor of the students from the department of science teaching leads us to think that during their elementary and secondary education, they became more acquainted with such technological devices.

Findings Concerning the Third Sub-question

The third sub-question of the present study is "Is there a significant difference among the attitudes of the pre-service teachers towards the effects of use of overhead projector and projector on learning depending on the environment they were brought up?" First the distribution of the pre-service teachers according to the environment they were brought up is given (Table 7), then the results of the t-test administered to determine whether the students' attitudes towards the effects of using overhead projector and projector vary significantly depending on the environment where they were brought up are presented in Table 8.

Table 7: Distribution of the Pre-Service Teachers According to the Environment Where They Were Brought up

Environment	Frequency	Percentage
Rural area	67	36.4
Urban area	117	63.6
Total	184	100.0

36.4% of the pre-service teachers come from rural areas and 63.6% from urban areas. As the number of the pre-service teachers coming from the urban areas is higher than that of those coming from the rural areas, this may have had a positive influence on the attitudes of the sampling towards the use of technological materials in education because the people living in urban areas can find more opportunities to engage in technology.

Table 8: T-test Results Concerning the Scale Scores of the Pre-Service Teachers According to the Environment Where They Were Brought Up

Environment	f	\bar{X}	S	df	t	p
Rural area	67	67.90	7.96	182	1.17	.25
Urban area	117	66.27	9.64			

The t-test results presented in Table 8 show that the pre-service teachers' attitudes towards the effects of using overhead projector and projector on learning do not significantly vary depending on the environment where they were brought up [$t_{(182)} = 1.17, p > .05$]. Hence, it can be argued that there is no significant relation between the attitudes towards technology and the environment where they were brought up. Moreover, whether there is a significant difference between the attitudes and the environment for each scale item was tested and only for item 12 "*Using overhead projector and projector in lessons makes learning more effective and efficient*" significant difference was observed. The attitudes of the students from the rural areas have more positive attitudes ($\bar{X} = 4.42$) towards this item than the students from the urban areas ($\bar{X} = 4.22$). This may be because the students from the rural areas did not find many opportunities to engage in technological devices and therefore, they find such materials more interesting and more motivating.

RESULTS

In today's world of technology and information, it is of great importance for students to gain skills required to have access to information and solve problems. Therefore, there is a need to put greater emphasis on the use of educational technologies in learning and teaching process. In the design of learning settings and in diversifying the teaching materials, the use of educational technologies have an important role to play. It is clear that when educational technologies are used properly, they contribute to increasing success. The present study deals with the use of two technological materials, overhead projector and projector, and aims to determine the attitudes of the pre-service teachers towards the effects of using these materials on learning.

In the present study, it was found that the lessons presented with overhead projector and projector draw the students' attention and arouse their curiosity. It was also found that these educational materials are thought to bring variety and changes to the learning and teaching process, help to eliminate the monotony in class, make the lessons more effective and efficient by making them more colorful and lively, help learning to occur in a shorter time span and allow students to observe the objects that can not normally be brought to class.

It was found that the attitudes do not significantly vary depending on the gender variable. Yet, the attitudes of the female participants were found to be more positive than those of the male participants

It was found that there are significant differences among the attitudes towards some items in the scale in relation to department attended and this is in favor of the pre-service teachers from the department of science teaching. These items are: "In lessons presented with overhead projector and projector, I can better understand difficult and abstract topics and concepts and visualize them in my mind", "In lessons presented with overhead projector and projector, learning takes place in a shorter time span", "When overhead projector and projector are used in lessons, light, color, movement and sound features help me to constantly focus my attention on the information presented", "I prefer lessons to be taught with overhead projector and projector to lessons taught with traditional chalk and black board", "Using overhead projector and projector in lessons helps me to retain the information longer", "Using overhead projector and projector in lessons makes learning more effective and efficient", "Using overhead projector and projector in lessons allows me to observe the objects, phenomenon and events which are impossible to bring to classroom environment", "Using overhead projector and projector in lessons eliminates the monotony in class and provides colorful, lively and interesting learning-teaching environment", "Using overhead projector and projector in lessons makes me willing to learn."

While no significant relation was found between the students' attitudes and the environment where they were brought up, a significant relation was found for the item "Using overhead projector and projector in lessons makes learning more effective and efficient." And in this respect, the attitudes of the students coming from the rural areas were found to be more positive than those of the students coming from the urban areas.

Research indicates that when used properly, technology enhances the learning and teaching process and improves students' motivation, problem solving skills, and critical thinking skills, (Yıldırım, 2000).

Before making generalizations in light of the findings of the present study, there is a need to point out the limitations of the study. First, the study is limited to the sampling used for the present study. Hence, further research conducted among the pre-service teachers from the different departments may result in the emergence of different dimensions.

It is clear that with the effective use of educational technologies, success in learning and teaching process improves. But while using educational technologies, students' learning level, their readiness, learning styles, motivation and expectations should be taken into consideration. In this way, both students are encouraged to fully participate in lesson and develop positive attitudes towards teaching materials.

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