THE EFFECT OF DISTANCE EDUCATION APPLICATIONS BASED ON SMART BOARD ON STUDENTS' ACHIEVEMENT AND SKILLS IN PATTERN PREPARATION TECHNIQUES

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ABSTRACT

The aim of this study is to find out the effect of distance education applications based on smart board in teaching pattern preparation techniques and its contribution to students' achievement and skills. An experimental model with a pretest-posttest experimental and control group was used with 34 students who attended the department of Ready-Made Clothing Teacher Training Programme at Selcuk University in Turkey.

As experiment group, distance education model by using the smart board was applied to the students synchronously. The students in the control group had the same lessons in traditional way in the classroom. The data was obtained using the achievement test, applied exam and skill observation form developed by the researchers and evaluated statistically with the help of Wilcoxon Signed Ranks and Mann Whitney-U tests.

The findings obtained after a four-week-application indicate that the synchronous distance education model by using smart board has been more effective on student achievements than the traditional way.

Keywords: Synchronous Distance Education, Smart Board, Pattern Preparing Techniques, Student Achievement, Student Skill.

INTRODUCTION

In rapidly changing and developing world, education area is one of the most important areas that should consider all the conditions today and for the future, of course, with the developing technology. The most important powers in education are information and communication technologies (ICT) that will provide the rapid change in higher education (Malasri, 2000) as the education is going on in a traditional way both in our country and the world (Başal and Gürol, 2011).

The need for the change in education and instruction increases the importance of instruction technologies, especially computers (Kocasaraç, 2003).

The smart boards including actual knowledge, and thus, increasing the motivation of students (Torff & Tirottla, 2010; Hennessy et all, 2007; Glover et all, 2006; Levy, 2002; Şen, 2001) covers the contents and applications that are to take place in books in future (Minor et all, 2006), and they are described "to have the permission of touching the smart boards with mouse and to have the capacity of showing the reflection of connected information related with computers" (Beauchamp, 2004: 328). The teachers can present the common subjects in different places to people at the same time when it is needed thanks to camera, video, smart boards, and they also can share their ideas with the people in different places in the world of course as experts (Starkings & Krause, 2008).
The smart boards, as the new concepts in education technology world with great improvement, are one of the most effective choices to reach the distance knowkedge or distance education (Ekici, 2008). The distance education application was used at first in 1728. It has been seen that all users related with distance education that are applied to all academic staff thought that this cognitive technologhy should be in the model education application that provides global education (İşman, 2011). Distance education has been decribed by Ozkul & Aydın (2012) as the learning process including the learners from the other places of world that have a chance to communicate with each other thanks to distance education based on different education resources of course with connection to distance education communication systems.

The most important fact is that it provides the communication among students and teachers in distance education in different forms media, newspapers, televisions or the conditions of these tools being used together (Moore et all, 1990). According to Ege and Sezer (2004), information and communication technologies give opportunity to get quality of print and result by spending little effort in a very short time and also increase the motivation of teachers and the staff in education and instruction. Moreoever, the needs have been solved thanks to virtual universities and the experts can extend their subjects not only to students but also they extend the subjects to many people in different places synchronously, especially if there is the lack of educational staff in such universities. So, they can eliminate this lack of knowledge with distance education technologhy (Yalabık vd., 2004). The virtual universities have been expected to teach all learners who are independent from each other in terms of getting distance education apart from the time and place in today's knowledge society. It means that distance education technologies can cover all kinds of learners who are in different places in world.

In Turkey, as for the skill training in the area of vocational education in this way, we can see a few applications of distance education and researches but so rare (Çeliköz and Gürsoy, 2013, Deperlioğlu ve Yıldırım, 2009; Sevindik ve Kayışlı, 2006). But there are universities including National Technological University in America (Daş and Varol, 2001), Open College in United Kingdom (Sargant, 2004) or Hagen University in Germany that give distance education based on vocational and technical education (Medeja et all, 2001; Varol ve Varol, 1999). It will be suitable or useful to use and try this distance education technology in clothing education including all the lessons especially in Pattern Preparation Techniques that constitutes the first step of clothing production (Avşar, 2006). The statement "How do distance education applications effect the students' academical achievement and skills based on smart board in teaching pattern preparation techniques?" is the problem statement of this research.

PURPOSE OF THE STUDY

This research aims to reveal the influence of distance education on the students' achievements and skills in teaching pattern preparation techniques. In this research, produced as the essence of PhD thesis, the answers to the following questions are sought in accordance with this general purpose:

1- In teaching Pattern Preparation Techniques, do the applications of distance education, based on smart board, influence the level of students'achievements?

- **Are there any meaningful differences in the level of students' achievements (posttest) in experimental group in comparison with the students' achievements in control group?**
- **Are there any meaningful differences in the access of pattern preparation techniques connected with achievement (pretest-posttest) of the students in the control and experimental groups?**

2- In teaching of Pattern Preparation Techniques, do the applications of distance education, based on smart board, influence the level of students' skills?

- **Are there any meaningful differences in the level of students' skills (posttest) in the experimental group in comparison with the students' skills in control group?**
- **Are there any meaningful differences in the access of pattern preparation techniques connected with skills (pretest-posttest) of the students in the control and experimental groups?**

METHOD

This section includes the model of research, study group, development of data collection tools, how the data is collected and analyzed.

Research Model

In this research, the information and skills about the subjects that are connected with the teaching of pattern preparation techniques has been collected and the data is about the students in experimental group and it is about the arranged distance education applications, synchronously. On the other hand, the data about the the students in the control group has been collected and the data is about face to face and traditional education applications.

At the end of the training, the influence on achievement and skills of students based on smart board and thanks to the synchronous distance applications of course comparing the other groups' conditions has been experimented. Therefore, the study is conducted on an experimental model.

Pretest–Posttest Control Based (Group) Design has been used as it is one of the real test models in this research since the real test models are created with randomly assigned application with samples and they are the most valuable models (Karasar, 2008) in terms of scientific model in many of groups.

Study Group

This study group consists of 34 students who were studying in Ready-Made Clothing Teacher Training Department in Vocational Education Faculty in Selcuk University in Konya and taking the lesson of Blouse Dress Pattern Preparation Techniques. The students are seperated in two groups randomly. One of the groups becomes experimental and the other one becomes control group thanks to the unbiased assignment methods. Since it requires the resemblance in terms of achievement and skills in groups, pretests before the experimental process has been applied and also Mann Whitney U-test has been applied in order to compare two independent groups.

According to the Pretest results, there is not significant (meaningful) difference,"α=0.05 level" between two groups in terms of both achievement scores and skill levels. So, before experimental process, both the experimental and control groups were equivalent in terms of achievement and skill levels.

Data Collection Tools and Its Development

Achievement test and skill observation form has been used,for the subjects of measuring in metric system, preparing basic body and sleeve pattern and relocation of dats, developed by the researchers, for in data collection. To ensure content validity, 34 questions have been prepared by getting the experts' opinions.

Among these questions, twenty questions consist of multiple choice test questions that are based on knowledge and comprehension steps related with cognitive objectives. The remaining 14 questions are practical exam questions that have been prepared according to target application steps. The total test time is defined as 140 minutes. The reliability of scale that has been tried on 100 students has been defined according to internal consistency coeficient. There has been used halving test (Split-half) and Kuder Richardson (Kr 20) formulas. The reliability coefficient of the tool has been calculated 0.93 according to Split Half and 0.87 according to Kr 20. Moreover, the average item discrimination index of achievement test has been found 0.56. It can be said that the reliability of achievement test is quite high.

An observation form has been used and it consists of 20 items that have been developed by the researchers in order to evaluate the skills of students in study group. The form consists of two parts, the first 14 items have been prepared for taking measure and the rest 6 items for the evaluation of drawing skills connected with sub-dimension. After first trials, when the scores have been observed, it has been seen that arithmetic average x=11,80 in first scorekeeper but x=11,87 in second scorekeeper. According to the result of Pearson Product Moment Correlation, 0,99 correlation has been found between two scorekeepers. When the same students have been evaluated, it has showed that the observation form to evaluate the skills of students gives consistent results and it indicates that it is reliable.

Data Collection

Achievement and skill levels of students who are in study group thanks to the application of pretest of course in the beginning have been determined. This application has been done before the experimental process. The students who are in experimental group joined pattern preparation techniques lessons in virtual classes on internet synchronously apart from the real classes.

The experimental process of course with distance education (SPE) by using the smart boards took four weeks . In control groups, the lesson has been done face to face and in a traditional way in real classes. The achievement test and observation form have been applied to all working groups as posttest again at the end of 16 lessons.

Data Analysis and Interpretation

According to datas that are solved in SPSS 16 program, the differences have been tested at the level of α=0.05. Mann Whitney–U test has been used to determine whether there is difference in experiment group or not by comparing (posttest) control group related with the achievement and skill levels in pattern preparation techniques. Wilcoxon Rank test has been applied to students by determining of achievement and skills of students whether there is difference or not in (pretest-posttest) a meaningful level. The results obtained from research have been presented and interpreted.

FINDINGS

In this part, there are study results and interpretations that have been obtained from research related with sub problems.

The Effect on Students' Achievement of Synchronous Distance Education Applications that are Based on Smart Board in Pattern Preparation Techniques:

In this research, during teaching of pattern preparation techniques by synchronous distance education based on smart board, it has been tried to determine whether there is meaningful difference in experimental group by comparing control group.

So, Mann Whitney –U test have been applied to compare two groups that are independent from each other and the results have been given in Table: 1.

Table: 1
Results of Mann Whitney U-Test in Regard to Comparison of Achievement Levels (Posttest) of the Students in Experimental and Control Groups

Success Levels	Posttest	N	Mean Rank	Sum of Rank	U	P	Acceptance
Knowledge	Experimental (SDE)	17	20,09	341,50	100,50	0,116	P>0.05
	Control (TE)	17	14,91	253,50			
Comprehension	Experimental (SDE)	17	19,74	335,50	106,50	0,162	P>0.05
	Control (TE)	17	15,26	259,50			
Application	Experimental (SDE)	17	21,85	371,50	70,50	0,010	P<0.05*
	Control (TE)	17	13,15	223,50			
General Success	Experimental (SDE)	17	22,32	379,50	62,50	0,004	P<0.05*
	Control (TE)	17	12,68	215,50			

According to the results of Mann Whitney –U test, when it has been evaluated in terms of general achievement scores, it can be seen α=0.05 level of meaningful difference. There are meaningful differences between the achievements of the students of experiment group and control group. When the order average has been observed, experimental group that has been applied SDE Application, has a high achievement level by comparing conrol group that has been applied TE process.

When the achievement of the students have been observed in sub levels, when rank mean values are analysed there is no significant difference statistically between groups in terms of knowledge and comprehension. But there is a meaningful difference in application process.

In Table: 2, Wilcoxon Signed Rank Test results has been given related to the other sub problems that attainment scores of students in both experimental and control groups (pretest-posttest).

Table: 2
Results of Wilcoxon Signed Rank Test Regarding the Achievement Attainment Scores of Students of both Experimental and Control Group (Pretest-Posttest)

Group	Success Levels	Pretest-Posttest	N	Mean Rank	Sum of Rank	Z	P	Acceptance
EXPERIMENTAL (SDE)	Knowledge	Negative Ranks	0	0	0	-3,638[a]	0,000	P<0.001*
		Positive Ranks	17	9	153			
		Ties	0					
	Comprehension	Negative Ranks	0	0	0	-3,324[a]	0,001	P<0.05*
		Positive Ranks	14	7,5	105			
		Ties	3					
	Application	Negative Ranks	0	0	0	-3,627[a]	0,000	P<0.001*
		Positive Ranks	17	9	153			
		Ties	0					
	General Success	Negative Ranks	0	0	0	-3,627[a]	0,000	P<0.001*
		Positive Ranks	17	9	153			
		Ties	0					
CONTROL (TE)	Knowledge	Negative Ranks	0	0	0	-3,640[a]	0,000	P<0.001*
		Positive Ranks	17	9	153			
		Ties	0					
	Comprehension	Negative Ranks	3	3,50	10,50	-2,843[a]	0,004	P<0.05*
		Positive Ranks	12	9,13	109,50			
		Ties	2					
	Application	Negative Ranks	0	0	0	-3,637[a]	0,000	P<0.001*
		Positive Ranks	17	9	153			
		Ties	0					
	General Success	Negative Ranks	0	0	0	-3,638[a]	0,000	P<0.001*
		Positive Ranks	17	9	153			
		Ties	0					

([a]) Based on negative ranks.
(*) indicates that a significant difference

When Table: 2 has been observed, its shown that post-test scores of all students in both experimental (SDE) and control (TE) groups have higher scores than pre-test scores and their signs are positive (+). In order to define whether the difference is meaningful or not in a statistically way, the process is the calculated in Z Values: [(SDE(z)=-3,627, p=0.000<0.001); (TE(z)=-3,638, p=0.000<0.001)] and when the rank average and total of scores are taken into consideration, there has been at the level of meaningful α=0.05 difference in experiment (SDE) and control groups (TE) before and after the experiment.

So, the great increase has been understood according to the teaching of pattern preparation techniques for all students in study group related with knowledge, comprehension, application levels and their general achievements. It also means that there are learnings in both groups according to given education and all the students are successful.

It can be said that the wanted cognitive teaching targets can become real in synchronous distance education applications related with pattern preparation techniques in clothing education. Marsap and Narin (2009) expresses that the quality of distance education system will increase out of %50 with face to face education process and connected E-learning with exact relations.

The Effect on Students' Skill Levels of Synchronous Distance Education Applications in Teaching of Pattern Preparation Techniques Based on Smart Board:

The another sub problem of research is whether there is difference of levels in experimental group of students who join synchronous distance education applications by comparing control group (posttest) of course based on smart board related with the skills of pattern preparation techniques. Mann Whitney U-test results have been given in Table: 3.

Table: 3
Results of Mann Whitney U-Test Regarding Comparison of General Skill Scores (Posttest) of Students of both Experimental and Control Groups

Skills	Posttest	N	Mean Rank	Sum of Rank	U	P	Acceptance
Taking Measure Skills	Experimental (SDE)	17	23,38	397,50	44,500	0,000	P<0.001*
	Control (TE)	17	11,62	197,50			
Drawing Skills	Experimental (SDE)	17	19,41	330,00	112,000	0,237	P>0.05
	Control (TE)	17	15,59	265,00			
General Skill Scores	Experimental (SDE)	17	22,94	390,00	52,000	0,001	P<0.05*
	Control (TE)	17	12,06	205,00			

There are differences between posttest scores for the students in experimental (SDE) group and control group (TE) related with genaral skills. It can be seen in Table 3. According to Mann Whitney U-test results, the difference between groups is: α=0.05 in terms of general skills score. It has been done to determine the meaningful differences in groups. When considered of skills scores in terms of sub ways, there has been found meaningful differences in measuring skills.

But when it has been compared in terms of drawing skills, there hasn't been an important and meaningful difference. So, there have been meaningful differences of the students who join SDE as experiment group related with pattern preparation techniques and general skills comparing the control group from sub ways related with measuring skills. It means that experiment group has more meaningful differences than control groups in terms of gainings. In order to find the source of this difference, when rank averages are examined, it can be seen that the level of experimental (SDE) group skills are higher than control (TE) group. As for drawing skills, the rank average of experimental (SDE) group is higher than conrol (TE) Group but it is not statistically important.

According to the interviews of students in experimental group, measuring subject has been understood well by smart board presentations, its content and videos. But they said that they didn't have chance to get feedback from the educational staff about the drawing that they had done because they were not in clasrooms. So, they couldn't correct the mistakes. This condition can be the cause of "why there is not any difference in drawing skills" while the experimental group is more succesful in terms of general skills and measuring skills.

Table: 4
Wilcoxon Signed Rank Test Results related to the Attainment Scores of Students of both Experimental and Control Groups in regard to their Skill Levels

Group	Skills	Pretest-Posttest	N	Mean Rank	Sum of Rank	Z	P	Acceptance
EXPERIMENTAL (SDE)	Taking Measure Skills	Negative Ranks	0	0,00	0,00	-3,647 [a]	0,000	P<0.001*
		Positive Ranks	17	9,00	153,00			
		Ties	0					
	Drawing Skills	Negative Ranks	0	0	0	-3,568 [a]	0,000	P<0.001*
		Positive Ranks	16	8,50	136,00			
		Ties	1					
	General Skill Scores	Negative Ranks	0	0,00	0,00	-3,650 [a]	0,000	P<0.001*
		Positive Ranks	17	9,00	153,00			
		Ties	0					
CONTROL (TE)	Taking Measure Skills	Negative Ranks	0	0,00	0,00	-3,658 [a]	0,000	P<0.001*
		Positive Ranks	17	9,00	153,00			
		Ties	0					
	Drawing Skills	Negative Ranks	0	0,00	0,00	-3,602 [a]	0,000	P<0.001*
		Positive Ranks	16	8,50	136,00			
		Ties	1					
	General Skill Scores	Negative Ranks	0	0,00	0,00	-3,636 [a]	0,000	P<0.001*
		Positive Ranks	17	9,00	153,00			
		Ties	0					

([a]) Based on negative ranks. (*) indicates that a significant difference

Wilcoxon Signed Rank Test has been given in Table: 4 in order to determine whether there is meaningful difference of (pretest-posttest) results for the students who are in experimental group in terms of pattern preparation techniques skills. When Table 4 has been observed, it can be seen that the students in experimental (SDE) and control (TE) group have high scores from posttest comparing to pretest scores and they have the sign of (+).

In order to define whether the difference is meaningful or not in a statistically way, the process is the calculated in Z Values: [(SDE(z)=-3,627, p=0.000<0.001); (TE(Z)=-3,638, p=0.000<0.001)] and when the scores order averages and their totals have taken into consideration , there has been at the level of meaningful a=0.05 difference in experimental (SDE) and control groups (TE) before the experimental and after the experimental.

So, there has been an increase in both groups in terms of pattern preparation techniques teaching. Also, there has been increase in drawing and measuring skills that consist of sub ways that would be difference rates.

DISCUSSION, RESULTS AND SUGGESTIONS

With the rapid developing science and technology, Multimedia applications have contributed lots of positive things in terms of getting motivation, making the learning easier, and increasing the students' motivation that include distance education and instruction (Şen, 2001). It has also affected the attitudes of students positively and stated in researches (Sünkür et al, 2012; Kırbağ et al, 2011). Many of the researches show that using of smart board increases the achievement of students even related with different lessons (Kaya, 2013; Tercan, 2012; Öztan, 2012; Deniz ve Tezer, 2009; Akdemir, 2009; Hwang, Chen & Hsu, 2006;). In literature, there are researches that show the E-Learning is as effective as traditional education (Başal & Gürol, 2011; Peterson & Bond, 2004; Ali & Elfessi, 2004).

When asked to the students of engineering about how they want to have a lesson, % 53 of them said that they backed up online-training and preferred face to face training by a research of Malasri (2012). It is not totally possible to get same learning results with distance education including traditional way and face to face education but it has been stated in the research (Karataş, 2003) that with technology based distance education and face to face education, the most powerful applications could be come together in this way. It means that both applications come together and reflects the right education application for students. Starkings and Krause (2008) have stated that when it is needed, the teachers could present the same subjects to people in different places at the same time, synchronously. In the research of Başal and Gürol (2011), with the using of Adobe Connect in fake classes, it has been stated that it could be created face to face education style thanks to this program using, also it could provide an area that teachers and students see themselves and speak among each other, also it provided a good opportunity to have the lesson effectively, Adobe Connect software has been used in this research and has been created a fake class area.

Moreover, thanks to using of smart board and application of distance education, it has been done a good distance education like face to face training.

In the research, by Celiköz and Gürsoy (2013), distance education has been done as asynchronous interaction based on technology training including pattern preparation techniques. But it was not simultaneous interaction.

According to results, there are increases in both groups including experiment and control groups. But there are not meaningful differences among groups. It means that there is a good and resemble learning in traditional group and experiment group. Since simultaneous distance education has been preferred based on smart board, it has been used face to face education benefits, so there has been much achievement in experiment group comparing control group. In the same research, the students in asynchronous distance education have higher skills level comparing to control group. In skills teaching and asynchronous distance education, the videos and video based presentations including distance education have been used effectively, and there have occurred similarities between the results of groups. In both researches, the results of skills including experiment group has been found more achievement than control group.

The general results are given below, according to research analysis:

- **There have been meaningful differences between experimental group who join synchronous distance education based on smart board and control group who have traditional teaching and learning area in terms of general achievements. When it has been observed in terms of sub ways, there is not meaningful difference about knowledge and comprehension. But the difference that is found for application levels are important.**
- **There has been a lot of differences in terms of knowledge, comprehension and application about pattern preparation techniques of control group. They are the same of both students who join distance education and tradition teaching application based on smart board.**
- **There are meaningful differences about the high scores of experimental group and control group based on smart board related with general skills level. Both groups have the same level in drawing skills.**
- **There are meaningful increases in both groups who join both applications about measuring skills, drawing skills and its general calculated skills. So both groups gained skills.**

The suggestions are given below:

- **It can be useful to gain cognitive behaviours based on smart board using in skill teaching, also it can be used distance education techniques applications as well,**
- **Distance education techniques application can be studied in other workings in cloth teaching with other branches subjects related with smart board,**
- **It can be studied an effect of harmony teaching style in distance education applications,**
- **It can be arranged lessons to universities with distance education in virtual classes in abroad by coming together,**
- **It can be backed the staff of universities that are get in trouble with distance education system,**

- **It can be taken lots of students to working group so the analyses are done with parametric tests,**
- **It can be applied experimental processes in order to measure its effects.**

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