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The Impact of Online Lecture Delivery Methods on Various Learning Styles in E-Learning System: A Comparative Study

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Abstract: Web based education systems have tremendous growth rate with all merits and demerits they have. However, several registered e-learners have been reported unsuccessful to complete their degrees. The e-learning systems' satisfaction comprises of various factors, i.e., interaction with contents, interaction with system, interaction with students and interaction with instructor. This study is undertaken to evaluate the effectiveness of teaching assistance during online lecture on various learning styles keeping in view that can teaching assistance be an effective factor during online lecture for students' satisfaction. A two-way independent ANOVA test is conducted to evaluate the results. It is found that adding a layer of teaching assistance has an impact on various learning styles in an online education system.

Keywords: E-learning; interaction, learning styles; ANOVA test

1. INTRODUCTION

The E-Learning market is visibly growing year-on-year. The compound annual growth rate of five years is estimated about 7.6% (Docebo, 2014). E-learning mode of education advantages its users by means of providing an interaction between learners and teachers or learners to learners beyond of time and space limitations (Katz 2002, 2000; Sun *et al.* 2008b). The other side of this growing mode of education includes failure also (Wu *et al.* 2006). The students enrolled in online courses do not complete their courses (Dutton *et al.* 2002; Zhang *et al.* 2004). The present study is undertaken to evaluate the impact of teaching assistance during an online lecture. The 80 participants were the undergraduate students of a Public University where an e-learning system is partially running to enhance learning. To undertake the experiment a course of networking for BSCS P-III and BSIT P-III was chosen. The subjects were randomly distributed in two groups. Students' learning styles were also detected using Kolb's Learning Style Inventory tool (KLSI). The two separate groups, i.e., Group A (Control Group) and Group B (Experimental Group) were experimented during an online lecture using different methods. To measure the learning level of the students of two various groups their scores of quiz was used as scale of measurement. A two-way between groups Anova test was conducted to test the impact of teaching assistance on various learning styles' learning outcomes. The study found a significant impact of teaching assistant on various learning styles. The results of this study can be helpful for the institutions to lessen the risk of failure of students in an online system of teaching and learning.

2. RELATED PAST WORK

While talking about the effectiveness of e-learning systems, it is essential to know about the factors important in effective e-learning environment. (Bouhnik, 2006) has mentioned different categories of interaction for the successful learning of an e-learner, i.e., interaction with instructor, interaction with students, and interaction with contents (Moore 1989; Bernard *et al.* 2009) also interaction with system as a fourth category. In e-learning systems interaction becomes a critical factor to learning outcomes (Zhang 2005). Therefore, to satisfy the requirements of e-learners, researchers started studies to fulfill the gaps between students and teachers of an online mode of education where the students and teachers are dispersed at distance areas but technology is acknowledged as a powerful tool to enhance learning (Krentler, Willis-Flurry 2005; Owston 1997; Ractham, Firpo 2011; Heba, Nouby 2008). Collaborative and cooperative support activities in e-learning systems are supported by many research studies (Preece 2000; Hamburg *et al.* 2003; Ractham 2011)

3. MATERIALS AND METHODS

3.1 Experimental Design:

To conduct the experiment for the present study certain steps are undertaken. The participants were the undergraduate students of a public university of

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Pakistan (online course students) with a partial program of e-learning. There were 80 participants who were randomly distributed into two groups, i.e., Control Group and Experimental Group. The study has to observe the results of two treatments, i.e., online lecture without teaching assistance and online lecture with teaching assistance. Finally, quiz (Assessments tool) was taken to ponder sore as scale of measurement for each group. Each group was comprised of all four learning styles of Kolb's model, which were detected after forming the groups, before delivering online lecture. The two groups were analyzed using two techniques, i.e., Independent T-Test and Two-Way ANOVA

3.2 Experiment Tools:

The following tools were used to conduct this experiment:

1. KLSI (Kolb 1976) was used to detect the learning styles of the students in both groups separately before delivering the online lecture using two methods
2. Online Lecture approved by 8 experts of the subject
3. Quiz approved by same 8 experts of the subject
4. SPSS to analyze the collected data.

3.3 Data Processing and Data Analysis:

This section will discuss the various techniques undertaken to analyze the data collected in this experiment.

3.4 ANOVA Test Summary:

This section will discuss the data collection, data processing and data analysis for the undertaken study.

3.4.1 Research questions:

The research questions for the study are as follows:

1. What is the impact of teacher's assistance during the online lecture on each learning style?
2. Can the teaching assistance layer play important role in online systems?

3.4.2 Hypotheses:

The initial hypothesis H0 and alternative hypothesis H1are:

H0:

Impact of online lecture without teaching assistance and online lecture with teaching assistance for various learning styles will be same.

H1:

Impact of online lecture without teaching assistance and online lecture with teaching assistance for various learning styles will not be same.

Independent Variables (IV):

1. Learning styles with four categories (levels)
2. Teaching Methods with two treatments (1. Online lecture 2. Online lecture with teacher's assistance)

Dependent Variable(DV):

Learning level using continuous data obtained from Quiz scores the next section will discuss the Results of the analysis of variance test.

4. RESULTS AND DISCUSSION

4.1Two-Way ANOVA Test:

A two-way between-groups analysis of variance was conducted to explore the impact of online lecturing methods, i.e. online lecture without teaching assistance and online lecture with teaching assistance on various learning styles, i.e., Diverger, Assimilator, Converger and Accommodator using Scores of quizzes. Subjects (Various learning styles) were divided into two groups, i.e. Online Lecture (Control Group) and Online Lecture with Teaching Assistance (Experimental Group).

Table. 1 Between-Subjects Factors

		Value Label	N
TeacherRole	1	onlineLect	40
	2	OLTeachAssist	40
LearningStyle	1	Diverger	27
	2	Assimilator	7
	3	Converger	15
	4	Accomodator	31

Table. 2 Tests of Between-Subjects Effects Dependent Variable: Score

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	187.912a	7	26.845	18.325	.000
Intercept	1501.285	1	1501.285	1024.811	.000
TeacherRole	43.918	1	43.918	29.980	.000
LearningStyle	98.359	3	32.786	22.381	.000
TeacherRole * LearningStyle	10.179	3	3.393	2.316	.083
Error	105.476	72	1.465		
Total	2467.000	80			
Corrected Total	293.388	79			

Table 3.Tests of Between-Subjects Effects
Dependent Variable: Score

Source	Partial Eta Squared
Corrected Model	.640a
Intercept	.934
TeacherRole	.294
LearningStyle	.483
TeacherRole * LearningStyle	.088
Error	
Total	
Corrected Total	

a. R Squared = .640 (Adjusted R Squared = .606)

There is a statistically significant main effect for Teacher role (online lecture and online lecture with teaching assistance) [F(1, 72)= 29.98, p=0.00]; however, the effect size was large (partial eta squared=.30). Also, there is a statistically significant

main effect for various learning styles [F(3, 72)=22.4, p=0.00]; however, the effect size was large (partial eta squared=.5).

Post-hoc comparisons using the Tukey HSD test indicated that the mean score for Divergers learning style (M=3.93, SD=1.2) is significantly different from the Assimilator (M=5.3, SD=1.3) and Accomodator (M= 6.55, SD= 1.8)also Converger (M=4.73, SD=1.7) is significantly different from Accomodator (M= 6.55, SD=1.8). The interaction effect [F(3, 72)=2.3, p=.083] did not reach statistical significance.

From the statistical results of Two-way ANOVA Test, it is found that the results are statistically significant therefore, the null hypothesis is rejected and alternative hypothesis H1 is concluded.

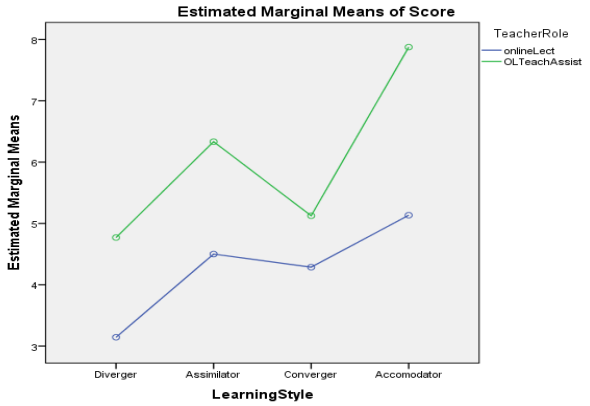


Fig. 1 Depicts the Estimated Marginal Means of scores of various learning styles of control group and experimental group

The line graph displayed above contains a good deal of information. In the light of context of experiment, the impact of teaching assistance/supervision during an online lecture is crystal clear. Various learning styles have shown improvement when they have teacher's assistance, their mean scores in quiz is higher than the mean scores obtained in quiz that was conducted after an online lecture without teaching assistance .

5. CONCLUSION

This study aims to investigate the impact of teaching assistance during the online lectures in an e-learning system. The results of the study suggests that teaching assistance during the online lecture influence increase in mean scores of all learning styles. No any learning style's mean score show that they did not increase their learning level when they will be provided a teaching assistance layer during the online lecture. Therefore, it is clear from results acquired that teaching assistance play important role in learning and knowledge performance of any learning style.

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