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DESIGN & FACILITATE A DIGITAL VIDEO-EDITING MODULE ONLINE

Abtract

This study presents the results of an experimental study that focuses on the effect of designing and facilitating an online module on digital video-editing in higher education. The model of Characteristics and learning patterns of field-dependent and field-independent individuals developed by Chen & Macredie (2002) was used as major guidelines to design and facilitate two versions of modules on digital video-editing in WebCT. The experiment was conducted at the University of Central Florida (UCF) in the fall 2005 term.

The research questions for this study were: (1) Is there a significant difference in students' learning achievement based on their treatments? (2) Is there a significant difference in students' attitudes toward computer technology based on their treatments? (3) Can students' learning achievement be predicted from their treatments, prior knowledge, attitudes toward computer technology, online learning experiences within the module, or any combination of these factors?

The participants' data were collected from their attitude surveys toward computer technology, pretests, posttests, and questionnaires related to the module. A repeated-measure control-group research design, One-way ANOVA, and multiple regression analyses were used to analyze data in this study.

The findings revealed that the participants could perform well in online learning environments. Moreover, students demonstrated higher scores in the treatment which emphasized guided navigation, extra cues, and the global view followed by the detailed view in the instructions. Participants' prior knowledge, online learning experiences within the module, and their attitudes toward computer technology predicted the participants' learning achievement.

Introduction

Students today are growing up with media and technology (Beck & Wade, 2004; Simpson, 2005). In order to motivate or teach this generation, it is important for educators or inservice teachers to communicate with this generation using their

language — media and technology (Bell, 2005). Elwes (2005) indicated that video is the "default" or "mainstream" medium in this century (p. 1). Therefore, these educators or inservice teachers need to know how to use video and integrate this media into curriculum to communicate with their students effectively (Bell, 2005).

Unfortunately, even though many inservice teachers see the trends and want to update their knowledge and skills on digital video to maintain competitiveness, traditional education seems arduous for them. Ordoñez and Ramler (2004) pointed out that formal education is a bigger challenge for adult learners like inservice teachers because they need to pay more attention on their family commitment. To meet these teachers' needs for lifelong learning, distance education is one of the alternatives that should be considered in higher education.

Moore and Kearsley (2005) define the term distance education as "… planned learning that normally occurs in a different place from teaching, requiring special course design and instruction techniques, communication through various technologies, and special organizational and administrative arrangement" (p. 2). One type of distance learning that has gained popularity in recent years is online or web-based learning. Hirumi (2002) defines online learning that "… is facilitated predominately through the use of telecommunication technologies such as electronic mail, electronic bulletin board systems, inter-relay chat, desktop videoconferencing and the World-Wide-Web" (p. 17).

Even though distance education is one of the alternatives for adult learners, the subject — digital video-editing may or may not be qualified to be provided online. Learners who are familiar with well-known computer applications, such as Microsoft Office, find it challenging to learn digital video-editing (Underdahl, 2003; Underdahl & NetLibrary Inc., 2005). If it is a challenge for adult learners to learn digital video-editing in face-to-face environments, is it possible for these learners to overcome these issues and even learn this subject in online learning environments?

The research questions for this study were: (1) Is there a significant difference in students' learning achievement based on their treatments? (2) Is there a significant difference in students' attitudes toward computer technology based on their treatments? (3) Can students' learning achievement be predicted from their treatments, prior knowledge, attitudes toward computer technology, online learning experiences within the module, or any combination of these factors?

This research will help educators make a better decision to implement their digital video-editing module in online learning environment. In addition, it will help researchers examine the similarities and differences of effects on factors such as students' prior knowledge, attitudes toward computer technology, online learning experiences within the module, and satisfaction levels between traditional and online learning environments in higher education.

Method

This study examined the effect of designing and facilitating a module on digital video-editing in WebCT. An experiment was conducted in the fall 2005 term at UCF. For the experiment, the researcher used a true experimental design to conduct

the study. The sample for this study was 83 of 97 preservice teachers enrolled in three sections of EME 2040 – Introduction to Educational Technology. EME 2040 is a required certificate course for all Florida State preservice teachers. This population included students from three of nine sections of the course offered in the fall 2005 term. The ratio of female to male participants was 3:1. One participant was removed because the participants' Pretest score was over the mean score of the Posttest of the experiment. Therefore, the data from 82 of the students were analyzed to answer research questions. Prior to the treatments could be administered, the participants completed attitude surveys to measure their attitude toward computer technology; the participants also took Pretest to measure their prior knowledge on digital video-editing module. A modified version of the Attitudes Toward Computer Technology instrument developed by Delcourt and Kinzie (1993) was used to measure learners' perceptions in terms of computer technology. The participants were randomly assigned to two different treatments. Following the treatments, the participants completed the Posttest and questionnaires for data collection on their performance results and online learning experiences within the module.

Two treatments were designed based on the following sources: Digital Video for Dummies (Underdahl, 2003) was used as the textbook and Windows Movie Maker Web site created by Microsoft (Microsoft Corporation, 2005) as the main content source in designing the online module. This module was placed in the WebCT courseware system, which was password protected. The content for these two versions were identical. These two versions, however, adopted the instructional design methods based on the learning model designed by Chen & Macredie (2002). The differences between the two treatments are: Treatment A provided guided navigation, extra cues, and the global view first and then the detailed view sequence in the instructions. Treatment B provided free navigation, less cues for independent learning, and the detailed view first and then the global view sequence in the instructions.

The Pretest and the Posttest for the treatment contained ten multiple-choice items for measuring students' knowledge-based skills and one performance test for measuring their performance-based skills of the content covered in the instructions, this researcher presented the findings for knowledge-based and performance-based learning achievement separately.

Students' online learning experiences within the module were collected via questionnaire. Because the questionnaire covered four factors (content, navigation, modality, and satisfaction levels), the data collected from the questionnaire were analyzed based on these factors. Students' responses were coded from 1 to 5 responding to the answers from strongly disagree to strongly agree. The scores for negative items in each area were reverse-coded. Therefore, students with higher scores had more positive attitudes toward online learning experiences within the module.

Three methods were used to analyze the data. A repeated-measure control-group research design was used to measure learners' learning achievement (pretests and posttests) differences between treatments. A one-way factorial analysis of variance (One-way ANOVA) method was used to measure participants' attitudes toward

computer technology differences between treatments. A multiple regression analysis was used to measure what factors (treatments, the participants' attitudes toward computer technology, prior knowledge, and online learning experiences of the module) could predict the participants' learning achievement. A 0.05 significance level was used as the basis for determining statistical significance. The Statistical Package for Social Science, Personal Computer Version (version 13) was the computer application used to analyze the data results.

Findings

Is there a significant difference in students' learning achievement based on their treatments?

Repeated measures with two between factors were used to analyze this research question. Pretest and the posttest for the treatment contained ten multiple-choice items for measuring participants' knowledge-based skills and one performance test for measuring their performance-based skills of the content covered in the module; findings for knowledge-based and performance-based learning achievement are presented separately.

Knowledge-based Learning Achievement

There was a statistically significant difference ($F_{1, 76} = 52.1$, $p < .01$) between students' pretest (= 26.09, SD = 8.12) and the posttest (= 35.96, SD = 10.03) scores in students; knowledge-based learning in online environments (see Table 1). Approximately 41% of the variance could be explained by the treatments. There was also a statistically significant difference in students' learning achievement and the treatments ($F_{1, 76} = 11.05$, $p < .01$). The participants in Treatment A (which emphasized the field dependent approach) (=37, SD = 9.18) had higher scores than those in Treatment B (which emphasized on the field independent approach) (= 34.87, SD = 10.87). About 13% of the variance could be explained by the treatments.

Performance-based Learning Achievement

There was a statistically significant difference ($F_{1, 79} = 3191.14$, $p < .01$) between Pretest (= 0, SD = 0) and the Posttest scores (= 45.64, SD = 7.3) in students' performance-based learning achievement (see Table 1). Approximately 98% of the variance could be explained by the time tests; however, there was not a statistically significant difference in students' learning

achievement based on the treatments ($F_{1, 79} = 1.59$, $p > .05$). The findings indicated that participants improved their scores from Pretest to the Posttest. The students also had better knowledge-based learning achievement in Treatment A. However, the treatments did not influence students' performance-based learning achievement.

Table 1: Participants' Learning Achievement Based on Their Treatments

Variable	Knowledge-Based			Performance-based
	df	F	df	F
LA(Pretest to the Posttest)	1,76	52.1**	1,79	425.83**
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Note. LA stands for learning achievement. * means significance at < .05 and ** means significance at <.01.

Is there a significant difference in students' attitudes toward computer technology based on their treatments?

One-Way ANOVA was used to answer this research question. Students' attitudes scores were collected from two subscales: comfort/anxiety and computer usefulness. A higher score on the comfort/anxiety scale meant that the participant had a higher comfort attitude; a higher score on the computer usefulness scale meant that the participant felt that the computer was more useful.

The findings indicated a statistically significant difference in students' comfort attitudes toward computer technology based on their treatments ($F_{1, 80} = 4.68$, $p < .05$). About 6% of the variance could be explained by their treatments. Students in Treatment A had higher comfort attitudes than those in Treatment B. No significant difference was found in students' attitudes toward computer usefulness ($F_{1, 80} = 0$, $p > .05$).

Can students' learning achievement be predicted from their treatments, prior knowledge, attitudes toward computer technology, online learning experiences within the module, or any combination of these factors?

Multiple regression analyses were used to analyze this research question. This researcher used both knowledge-based and performance-based posttest scores as dependent variables to analyze the question because students' learning achievement could be analyzed in two components.

Knowledge-based Learning Achievement

The content factor of online experiences within the module was the only factor that had a statistically significant relationship with students' knowledge-based learning achievement ($F_{1, 72} = 12.2$, $p < .01$). Students who had higher positive opinions about the content factor of online learning experiences within the module demonstrated higher knowledge-based learning achievement scores. About 13% of the variance could be explained by the factor. The equation was as follows:

Y' (Knowledge-based learning achievement) = 22.42 + 0.84* (content)

Performance-based Learning Achievement

Participants' prior knowledge, opinion about the content factor of online learning experiences within the module, and their attitudes toward computer usefulness were the factors that had a statistically significant relationship with participants' performance-based learning achievement ($F_{3, 71} = 6.82$, $p < .01$). About 22% of the variance could be explained by those factors. The equation was as follows:

Y' (Performance-based learning achievement) = 43.66 + 0.3 * (Pretest) + 0.49* (content) -0.35 (attitudes toward computer usefulness)

Based on the findings, students who had positive attitudes toward the content of the module exhibited both higher knowledge-based and performance-based learning achievement.

Moreover, students who had a higher Pretest score and had negative attitudes toward computer usefulness demonstrated higher performance-based learning achievement.

Conclusions

The findings indicated that a statistically significant difference was found in participants' learning achievement between time tests. Participants could perform well by studying in an online learning environment. Furthermore, participants demonstrated higher scores in the treatment which emphasized guided navigation, extra cues, and the global view followed by the detailed view in the instructions (Treatment A). The participants' prior knowledge, online learning experiences within the module, and attitudes toward computer technology predicted the participants' learning achievement. However, the reason why students who felt the computer was not useful demonstrated higher scores on performance-based learning achievement can not be explained by this researcher or current literature reviews. The findings of this study also indicated that students could demonstrate higher performance-based learning achievement if they had more experiences on the subject matter and higher knowledge-based and performance-based learning achievement if they felt the instructions were easy to follow and the workload of the module was manageable.

Recommendations

Based on the findings and conclusions, the recommendations for future studies are listed below:

1. In this study, student-to-student and teacher-to-student interactions might affect students' learning achievement. Future studies should consider those interactions as factors and examine their effect on students' learning achievement.
2. Students in this study came from a Web-enhanced section. Future studies should consider delivering the same treatment in a World Wide Web mode to examine the differences.

3. More data needed for the relationship between students' attitudes toward computer technology and their learning achievement in online learning environments to generalize the findings in this study.

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