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Effects Of Interaction On Students' Perceived Learning Satisfaction In University Online Education: An Empirical Investigation

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EFFECTS OF INTERACTION ON STUDENTS' PERCEIVED LEARNING SATISFACTION IN UNIVERSITY ONLINE EDUCATION: AN EMPIRICAL INVESTIGATION

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Abstract:

This study examined the antecedents and outcomes of interaction in asynchronous online learning courses. The research model was tested by using a Partial Least Squares analysis on the survey data. A total of 397 valid unduplicated responses from students who have completed at least one online course at a university in the Midwest were used to examine the structural model. All hypotheses except one in this study were supported. We found that all three factors - course structure, self-motivation, and learning styles - influenced students' interaction with the instructor and classmates. Further, there is a positive relationship between interaction and students' satisfaction. This is in accordance with the findings of the extant literature on student satisfaction we have discussed. The structural model results also reveal that user satisfaction is a significant predictor of learning outcomes, but the model failed to support the relationship between interaction and the learning outcomes of e-learning classes in relation to face-to-face classes.

Keywords: Distance Education/Distance Learning, Asynchronous Learning, User-Satisfaction, Perceived Learning Outcomes, Motivation, Student Learning Styles, Course Structure, Structural Equation Modeling.

I. INTRODUCTION

According to transaction theory of Moore(1997), the physical distance between the instructor and the students in e-learning creates a psychological and communication gap between them. The transactional distance in distance education is a function of Dialogue, Structure, and Learner Autonomy. Moore (1997) also described a wide range of factors that influence the nature of dialogue. They include as the number of students enrolled in the class, the frequency of opportunity for communication, communication media, instructor personality, student personality, and course content.

Interaction between participants in online courses has been recognized as the most important construct of the dimensions determining Web-based course quality. Hence, many studies have shown that interaction is highly correlated to the learning effectiveness of Web-based courses and most students who reported higher levels of interaction with content, instructor, and peers reported higher levels of satisfaction and higher levels of learning. (Swan, 2001; O'Reilly and Newton, 2001; Moore, 1989; Vaverek and Saunders 1993). In contrast with studies indicating high levels of correlation between interaction and learning effectiveness, some studies warn that too much or too little interaction may cause a negative correlation with learning effectiveness (Berge, 1999; Marilyn 2000).

The primary objective of this study is to investigate the relationship between interaction and students' perceived learning outcomes and satisfaction in university online education using e-learning systems. According to Moore (1997), Dialogue refers to "an interaction or series of interactions having positive qualities that other interactions might not have." The positive qualities are referred to "purposeful, constructive and valued by each party." Using the extant literature, we begin by introducing and discussing a research model illustrating factors affecting e-learning systems outcomes. We follow this with a description of the cross-sectional survey that was used to collect data and the results from a Partial Least Squares (PLS) analysis of the research model. In the final section, we summarize and conclude with the implications of the results for online instructors. Further, we suggest several ways of improving future research.

II. RESEARCH MODEL

Our conceptual model illustrating factors potentially affecting e-learning systems outcomes is built on the conceptual frameworks of Piccoli, Ahmad and Ives (2001). Piccoli, Ahmad and Ives (2001) refer to human and design factors as antecedents of learning effectiveness. In an earlier study (Eom, Ashill, & Wen, 2006), six important constructs (student self-motivation, student learning style, instructor knowledge and facilitation, instructor feedback, interaction, and course structure) are identified. This study examined the factors that affect the perceived learning outcomes and student satisfaction in asynchronous online learning courses. Their research model was tested by using a Partial Least Squares analysis on the survey data. All six factors - course structure, self-motivation, learning styles, instructor knowledge and facilitation, interaction, and instructor feedback – were found to significantly influence students' satisfaction.

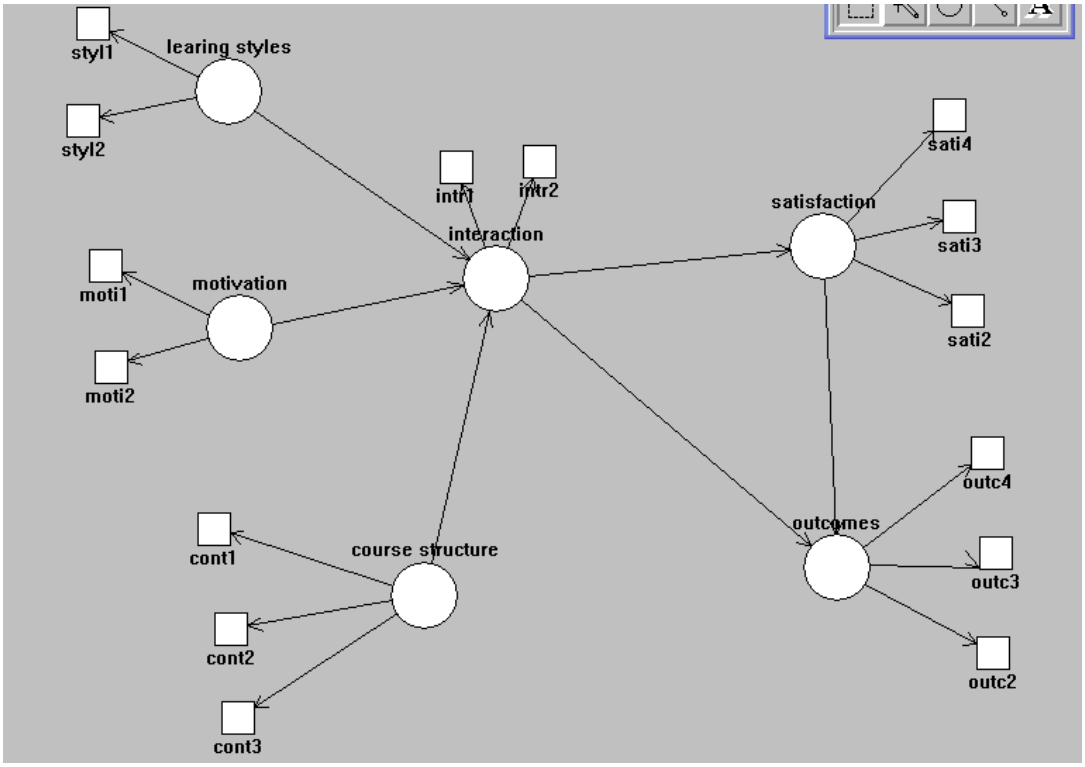

Figure 1: Research Model

Of the six factors hypothesized to affect perceived learning outcomes, only two (learning styles and instructor feedback) were supported. Contrary to previous research (LaPointe & Gunawardena, 2004), the earlier study found no support for a positive relationship between interaction and perceived learning outcomes. One possible explanation for this finding is that the study did not account for the quality or purpose of the interactions. Although a student's perception of interaction with instructors and other students is important in his/her level of satisfaction with the overall online learning experience, when the purpose of online interaction is to create a sense of personalization and customization of learning and help students overcome feelings of remoteness, it may have little effect on perceived learning outcomes. Furthermore, a well-designed online course delivery system is likely to reduce the need of interactions between instructors and students.

Our research model, as illustrated in Figure1, is a further extension of (Eom, Ashill, & Wen, 2006). The extended model is built based on the suggestion of LaPointe and Gunawardena (2004). They believe that motivation, learning styles, learning orientation, or personality

characteristics are critical variables that need to be included in future testing of models peer interaction. We focus on the interaction and its relationships with students' perceived learning outcomes and satisfaction in university online education. Underlying assumption of this study is that the strength of interaction may be influenced by learning style, motivation, and course structure.

Students' Learning Style

There are some empirical studies that investigated the direct relationships between interaction and students' perceived learning outcomes and satisfactions in university e-learning (Eom, Ashill, & Wen, 2006). But there are few studies that explore the interaction construct as mediating variables that connects three other attributes (learning styles, motivation, and course structures). Therefore, we hypothesized:

> H1: there will be a positive relationship between students learning styles and the level of perceived interaction between the instructor and students and between students and students.

Student Self-Motivation

The extant literature suggests that students with strong motivation will be more successful and tend to learn the most in web-based courses than those with less motivation e.g., (Frankola, 2001; LaRose & Whitten, 2000). Students' motivation is a major factor that affects the attrition and completion rates in the web-based course and a lack of motivation is also linked to high dropout rates (Frankola, 2001; Galusha, 1997). It is conceivable that students with the high level of motivation be positively related to a high level of interaction with the instructor and students. Thus, we hypothesized:

> H2: There will be a positive relationship between students' level of motivation and the level of interaction between the instructor and students and between students and students.

Course Structure

Course structure is seen as a crucial variable that affects the success of distance education along interaction. According to Moore (1991, p.3), the course structure "expresses the rigidity or flexibility of the program's educational objectives, teaching strategies, and evaluation methods" and the course structure describes "the extent to which an education program can accommodate or be responsive to each learner's individual needs." Student's attitude and behavior changes significantly when the instructor assign forum activities as a grading component. We theorize that course structure will be strongly correlated to interaction. Thus, we hypothesized:

> H3: There will be a positive relationship between a good course structure and the level of interaction between the instructor and students and between students and students.

Interaction

Among the many frameworks/taxonomies of interaction (Northrup, 2002), this research adopts Moore's (1989) communication framework which classified engagement in learning through (a) interaction between participants and learning materials, (b)interaction between participants and tutors/experts, and (c)interactions among participants. These three forms of interaction in online courses are recognized as important and critical constructs determining the performance of web-

based course quality. Most students who reported higher levels of interaction with instructor, and peers reported higher levels of satisfaction and higher levels of learning (Swan, 2001).

Therefore, we hypothesized:

H4a: A high level of perceived interaction between the instructor and students and between students and students will lead to a high level of user satisfaction.

H4b: A higher level of perceived interaction between the instructor and students and between students and students will lead to higher levels of student agreement that the learning outcomes of on-line courses are equal to or better than in face-to-face courses.

III. METHODOLOGY

These hypotheses were tested using a quantitative survey of satisfaction and learning outcome perceptions of students who have taken at least one online course at a large Midwest university in United States. Structural equation modeling is employed to examine the antecedents and outcomes and student satisfaction of interactions in university online education.

Survey Instrument

After conducting an extensive literature review, we designed a list of questions that we believed were logically associated with the factors in our model. The survey questionnaire is in part adapted or selected from the commonly administered IDEA (Individual Development & Educational Assessment) student rating systems developed by Kansas State University.

In an effort to survey students using technology enhanced e-learning systems, we focused on students enrolled in Web-based courses with no on-campus meetings. We collected the e-mail addresses from the student data files archived with every online course delivered through the online program of a university in the mid-western United States. From these addresses, we generated 1, 854 valid e-mail addresses. The 42 survey questions were generated by FrontPage 2000. The survey URL and instructions were sent to all valid e-mail addresses. We collected 397 valid unduplicated responses from the survey.

The research model (figure 1) was tested using the SEM-based PLS methodology for two reasons, because PLS is well suited to the early stages of theory building and testing(Chin, 1998). It is particularly applicable in research areas where theory is not as well developed as that demanded by LISREL (Fornell & Bookstein, 1982) as is the case with this research study.

V. CONCLUSIONS

This study examined the antecedents and outcomes of interaction in asynchronous online learning courses. The research model was tested by using a Partial Least Squares analysis on the survey data. All hypotheses except one in this study were supported. We found that all three factors - course structure, self-motivation, and learning styles - influenced students' interaction with the instructor and classmates. Further, there is a positive relationship between interaction and students' satisfaction. This is in accordance with the findings of the extant literature on student satisfaction we have discussed.

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