Effects of Interaction on E-Learning Satisfaction and Outcome:  
A Review of Empirical Research and Future Research Direction

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ABSTRACT

We have reviewed several e-learning empirical research studies that have investigated the effects of interaction on satisfaction and outcomes of e-learning, published between 2001 and 2010. Their conclusions seemed inconclusive, ranging from no relationships between interactions and two dependent variables (satisfaction and learning outcomes) to positive relationships. In-depth analyses of these empirical studies conducted by examining dependent and independent constructs and their indicators, research methods, and participants’ characteristics. We conclude that the conflicting results are due to primarily different definitions of the dependent and independent constructs and their indicator variables, different research methods employed, and participant’s demographic characteristics. In order to build e-learning theories and a cumulative research tradition, it is necessary to (1) define the dependent/independent constructs and their indicators, (2) employ common research methodology, and (3) test commonly accepted causal models. Further, we suggest the following three recommendation to guide the future research. They include using only dialogue, instead of mixing dialogue and interaction, conducting learning theory-based holistic approach, and proper treatment of contextual variables.

KEYWORDS
Cumulative Tradition, Dependent Variables, Dialogue, Distance Learning, e-Learning, Empirical Research, Independent Variables, Interaction, Learning Outcomes, Research Methods, Satisfaction

INTRODUCTION

Interaction is one of the controversial topics in e-learning literature. Overall body of knowledge that has accumulated over the past decade seemed inconclusive and needs critical analyses. The core of e-learning or distance education theory centers around overcoming transaction distance which is described by Moore (1997, p. 22) as:

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The transaction that we call distance education occurs between teachers and learners in an environment having the special characteristic of separation of teachers from learners. This separation leads to special patterns of learner and teacher behaviors. It is the separation of learners and teachers that profoundly affects both teaching and learning. With separation there is a psychological and communications space to be crossed, a space of potential misunderstanding between the inputs of instructor and those of the learner. It is this psychological and communications space that is the transactional distance.

According to transaction theory of Moore (1997), the transactional distance in distance education is a function of Dialogue, Structure, and Learner Autonomy. Many measures of learning outcomes have been used in e-learning research including overall perceived effectiveness (Peltier, Drago, & Schibrowsky, 2003), satisfaction and learning outcome (Eom, Ashill, & Wen, 2006), grade received and satisfaction level (Abdous & Yoshimura, 2010). Consensus seems to be forming among e-learning empirical researcher as to the dependent variables such as satisfaction and outcomes. Nevertheless, there are a wide range of differing opinions as to indicator variables to measure the level of outcomes and satisfaction.

This study reviews previous e-learning empirical studies that investigated the relationship between the interaction and students’ perceived learning outcomes and satisfaction in university online education covering the period 2001-2010. The following section reviews eight e-learning empirical studies. Their conclusions seemed inconclusive. One study found no relationships between interactions and two dependent variables (satisfaction and learning outcomes). Five studies found positive relationships between interactions and two dependent variables. Two studies concluded that interactions significantly affect e-learning satisfaction, but not learning outcomes. To find an answer to the perplexing issue, we critically review and analyze the dependent and independent constructs and their indicator variables, research methods, and diversity of samples. The next section reviews the literature highlighting those issues of dependent variables, research methods, and participants’ characteristics. Based on the review, we report the findings and suggest future research directions.

LITERATURE REVIEW

To highlight the major differences among the selected empirical studies, we compiled and contrasted eight empirical studies with particular attention to the four issues (Table 1 and Table 2). They are the dependent constructs and their indicators, three independent constructs and their indicators, research methods, participant characteristics, and findings. Of these 8 studies, two studies use single variable and 6 studies used constructs with indicator variables. A first logical step to demystify these inconclusive findings is to cluster all these papers into by research methods: (1) analysis of variance (ANOVA) and correlations analysis, (2) factor and regression analyses and (3) structural equation modeling (SEM).

Empirical Studies with Single Indicator Variable

Two studies (Swan, 2001; Wilson, 2007) used single indicator variables and 6 other studies used SEM and other multivariate statistical analyses. Findings of the two studies that employed ANOVA and inter-item correlations analyses are quite different. While Swan’s study suggested a high correlation among satisfaction, learning outcomes, and interaction, Wilson found a small impact of interaction on satisfaction but no definitive connection between learning outcome (grade received) and interaction.
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