

Relationship among course type, self-efficacy, mentor and learning performance: Toward e-learning satisfaction model

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Abstract: This study examines the potential relational model of e-learning satisfaction and learning performance in blended learning and online learning alone. We then focused on five factors and one variable based on our practical research, in order to compare course type and investigate the relationship among them; course type, self-efficacy, satisfaction with mentor's behavior, perceived learning consciousness during learning, clarity of material as factors and test score as performance. The results showed the significant effect of course type on satisfaction with mentor's behavior. The significant relationship, on the other hand, was revealed between factors and performance, which indicated that course type, self-efficacy, mentor, clarity of materials and learning consciousness play an important role in successful learning online learning.

1: Introduction

There is a growing interest in the use of computer networks for e-learning with the advancement in information technology. Network technology is often used not only at homes, but also in educational settings such as in the classrooms. Network technology allows teachers to offer Internet-based course in learning, and learners can study course whenever and wherever they want. However, it seems to be difficult to keep their motivation for successive learning in e-learning alone, as a result, learners easily drop out. In online learning, learners have to keep self-pacing consciousness, because teachers do not instruct the learners. Therefore, one effective solution would be in the use of blended learning with face-to-face; blended lectures would be practical and effective for online learning (Matsuda, 2004). Thus, learners are motivated to learn even in online alone environment. But, it may lose merit in online learning alone from the viewpoint of learning flexible opportunity for learners. Considering factors for successful learning in e-learning will be one of the central issues (Womble, 2006), given the increasing number of online learning over the world. This study aims to examine the relationship between such factors and learning performance.

2: Factors for successful e-learning

This study focuses on five factors which seem to be important for successful learning, based on practical studies (Matsuda, 2004; Matsuda et al 2007a). We evaluate test score as learning performance, examining the relationship with factors.

2-1: Course Type

Course type in this study focuses on two types of course; Blended Learning and Online Learning.

Blended learning is defined as “offering online course in order to compensate face-to-face course” (Bersin, 2004). Blended learning seems to make learners to be aware of “learning”, and then contributes to successive learning (Bersin, 2004). However, learners have difficulty to have face-to-face course as blended course due to time. In particular, worker has no time to receive the course in Japan, as a result distance learning such as online learning helps them to make opportunities to receive self-development program (Quality-of-Life Policy Bureau, 2007).

2-2: Self efficacy

“Self-efficacy” is the cognitive process which learner recognizes needed action and feels that they can accomplish task or their purpose (Bandura, 1986). Although people understand what they should do, they hardly behave, in order to accomplish a purpose. Self-efficacy is creative ability from the cognitive and social viewpoints (Bandura, 1986, 1997). However, High self-efficacy may lead successful learning. Therefore they are required to make a continuous effort to perceive self-efficacy. Learning design needs to be coincident with learning outcome, adjusting the course level. It motivates learners to learn positively.

2-3: Mentor

Mentor assists learner’s activity in online learning affectively such as informing course details and counseling (Matsuda et al, 2007b). Learner’s attitude toward learning may depend on mentor’s behavior. In our course, mentor has to reply to learner within twenty-four hours since mentor received message from learner. Mentor keeps main position to communicate with learners. Therefore, it seems that evaluation of mentor’s behavior directly influences on the satisfaction with course (Lee et al, 2006).

2-4: Learning consciousness

Understanding learning purpose motivates learner to learn positively, in particular, learning consciousness such as realizing learning purpose during learning contributes to high learning performance in online learning (e.g., Yamada et al, 2007).

2-5: Clarity of material

Understandability and readability of material are crucial factors for successful acquisition in online learning. Reading a material and listening to an explanation synchronized with material procedure are essential to understand content, as the result, it possibly affects satisfaction with overall course and learning performance.

3: Course and Collected Data

In our university, online courses and blended courses combining face-to-face and online classes targeted at an e-learning professional have been offered on trial since 2002. The course is conducted as a regular course this year. All online courses are offered through the Learning Management System “Cyber Campus System” (CCS), which enables learners to access and undergo the courses wherever learners can use the Internet. In this study, we conducted the research in course “Fundamentals of IT for Education”. This course has two types; online and blended learning with face-to-face and online. This course distributes two types of learning materials; PDF and VOD materials. Table 1 shows the overview of

course. The aim of this study is to investigate the contribution of factors which explains in section 2 to learning performance. Data were collected in two ways. The first is through a questionnaire. All subjects were required to answer a questionnaire at the end of each semester. The questionnaire asked all subjects to rate the perceived effect through the courses. All questions were designed based on a 4 point scale (1: not at all – 4: very much). The number of questions is thirty-four. The sample questions asked to the subjects are listed in Table 2. The second data collection method is test, in order to collect the data about learning performance.

Table.1 Overview of two types of the course

	Blended learning	Online learning
Ratio of e-learning	46.1% (6 times for e-learning / 13 times for all)	100%
Number of students	49	76
Number of mentors	2	2

Table.2 Factors, Number of Items and Sample Questions

Factors	Number of questions (items)	Sample questions
Self efficacy	10	Rate the confidence which you can explain the client-server system concept Rate the confidence which you can explain TCP/IP layer model
Satisfaction with mentor	10	Rate the perceived effectiveness of explanation from mentors Rate the familiarity with mentor
Learning consciousness	3	Rate the perceived consciousness of learning objectives during learning Rate the motivation to accomplish learning objective during learning
Clarity of materials	11	Rate the perceived clarity of tables and figures in PDF material Rate the perceived clarity of movies in VOD material
Course Type	-	1: Blended learning 0: Online learning

4: Results

The numbers of data collected from the questionnaire within each course are 21(42.9%) for blended learning and 9(11.8%) for online learning. Questions concerning each factor collected by the questionnaire and test score were analyzed using T-test and path analysis. T-test on 5 factors and test score reveals significant high effect only on the satisfaction with mentor's behavior in online learning alone, compared with blended learning ($t = 2.129$, $p < 0.05$, $df=27$). Figure 1 shows the result of T-test.

In order to find the relationship, path analysis was conducted among five factors and test score. Before

path analysis, dummy variables were used to differentiate the course type used. A variable, “blended learning” was set to 0 when blended learning was used and to 1 when online learning alone was used. Figure 2 shows the relationship between each significant variable.

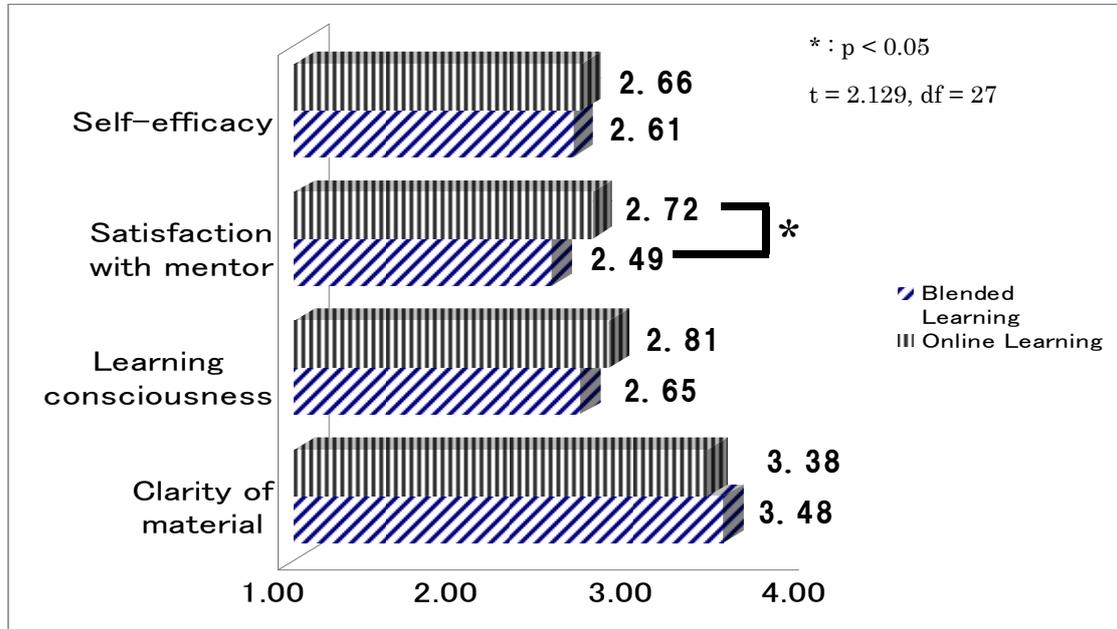


Figure 1. The result of T-test for each factor

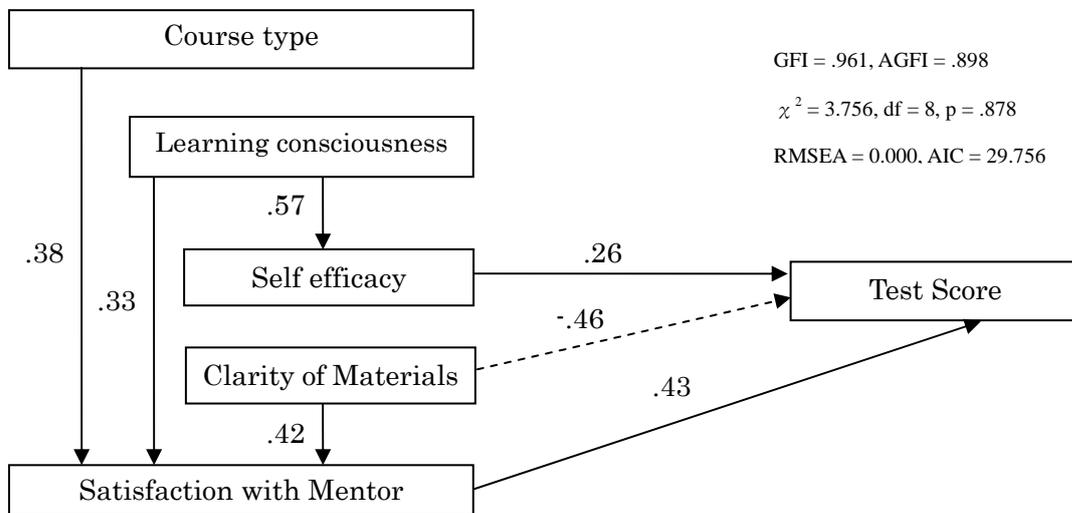


Figure.2 Relationship between each variable by path analysis

(all line means significant relationship p < 0.05; dotted line means negative relationship; Standardized partial regression coefficient (SPRC) was shown in each path)

5: Discussion

5-1: Blended learning and online learning

In this study, we found that course type affected the satisfaction with mentor, as the result of T-test reveals the significant effect of online learning alone. Learners could be conscious of the necessity of

assistance in online learning from the viewpoints of motivation, trouble shooting and learning procedure. Mentor informs lecture information and sends e-mail for peer-support. In online learning, mentor mainly assists learner's learning activities. In blended learning, learners could have opportunities to receive the assistance from not only mentor, but also instructor and teaching assistants in face-to-face lecture. These results suggest that learners in blended learning environment can use useful resources such as teaching assistant, instructor which is suggested by Anderson's (2001) framework. Another one is the mentor's role in this study. Mentors assisted learner's activities focused on online environment. Thus, learners in online learning seemed to benefit from mentors more than blended learning. Blended learning can lessen a mentor's burden. This point should be clear in next research based on role model in e-learning.

5-2: Relationship among factors and test score

The result of path analysis shows some significant relationship between factors and test score. Self-efficacy, clarity of materials and mentor's assistance seems to be essential in successful online learning. These three factors are the direct indicators of learning outcome. Factor "Satisfaction with mentor" is affected by and affects other factors. Clarity of material has direct and indirect relationship with learning performance (SPRC : 0.18). Clarity of material affects negatively to learning performance, that is, when learners recognize the understandability of materials, it can lead to low learning performance. However, clarity of materials has positive effect on learning performance indirectly mediated by satisfaction with mentor's behavior. It seems that effect of learning materials is enhanced by mentor's activities in online learning.

Satisfaction with mentor can be affected by learner's learning consciousness during learning, which indicates motivation and meta-cognitive skill. Learners who are conscious of learning objective during learning can recognize the effect of mentor's activities on learner's learning, as a result they achieve high learning performance. Course type effect on the satisfaction with mentor also important in the relationship to learning performance, as the result of t-test shows in 5-1. Mentor is a key factor which leads to continuous learning in online learning environment (Matsuda et al, 2007b). Mentor facilitates learners' activity from the viewpoint of affective side, in order to accomplish learning in online environment.

Self-efficacy also affects on learning performance directly, mediated by learning consciousness. Learners who have high consciousness of learning objective may perceive high self-efficacy. Self-efficacy is one of the processes in self-awareness in social cognition (Bandura, 1997), which has close relationship with meta-cognitive process. It is suggested that consciousness of learning objectives and perception of effect in each learning stage contribute to high perception of self-efficacy. Thus, self-efficacy can be direct indicator of learning performance. This study cannot examine the relationship among course type, self-efficacy and mentor as a result of path analysis, because this study did not examine the concrete activities of mentor. In future research, this point will need to be clarified, collecting data from mentor activity reports.

6: Conclusion and Future works

This study aims to investigate factors for successful learning and challenge to build prototype model of the relationship between factors and learning performance. Course type such as blended learning and online learning was found to have been effective in satisfaction with mentor, although it does not affect other subjective evaluations and test score. Path analysis reveals significant relationship between factors and test score. It suggested that role of mentor, self-efficacy and clarity of materials is center on the

success on learning using online environment. Future work towards the realization of e-learning satisfaction model in both online and blended learning is as follows:

1) Analyzing data from the viewpoint of self-regulated learning

This study shows that course type has significant effect on the satisfaction with mentor. However there is no significant effect on other factors. It is suggested that course type is not main factor to affect e-learning satisfaction and learning performance. It seems that learner's consciousness such as self-regulated learning (e.g., Pintrich et al, 1990, Zimmerman, 1998) and learning strategies (Pintrich et al, 1990), motivation and learning anxiety (Bandura, 1986) affects active learning in online environment.

2) Building e-learning satisfaction model by increasing learners

This study indicates the potential model for e-learning satisfaction and learning performance. However, this study has limitation; the results may not be applicable to other e-learning courses. Causal connection among each factor and test score should be clarified by multivariate analysis covariance structure analysis based on concrete analysis of each factor, increasing sample size.

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