Instructional and Learner Factors Influencing Learning Outcomes within Online Learning Environment

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Among many studies focusing on the effect of learner and instructional variables on learning outcomes, few studies have investigated the learners' study habits and the mediating mechanisms among the learner and instruction variables in their influence on learning satisfaction and outcomes. This study examined differences in learning satisfaction and outcomes based on learner characteristics and study habits and the effects of instructional and learner variables on the course outcomes for an online course.

Keywords: Online Learning, Learning Outcomes, Learning Motivation

Online education has become a major force in higher education and is expected to continue it's rapid growth. A recent national survey from the Sloan consortium reported that the majority of the faculty members in colleges and universities viewed online education as capable of providing equal or superior learning experiences compared to those from classroom instruction. Muilenburg and Berge (2001), however, reported some major quality issues for distance learning programs within private sectors such as ineffective administration, organizational change, poor technical skills, and lack of social interactions in distance learning. From these research findings, we have come to know the prevalence of online education and which factors are affecting the overall quality of distance learning programs. Less known in the literature is what are the mediating mechanisms of such factors in affecting the quality of online learning at the course level.

Problem Statement and Significance of the Study

The history of online education, which uses the Internet as the primary content-delivery and communication media, is not long. The researchers' summary of the online education literature indicates that 'macro' level efforts have been made to create theoretical frameworks to: (a) guide the design of Internet-based learning environments (Hannafin, Land, & Oliver, 1999), (b) identify instructional strategies and challenges of online teaching and learning (Palloff & Pratt, 1999), (c) examine the types and roles of interactions (Hirumi, 2002; Northrup, 2001), and (d) examine the effect of learner characteristics, such as demographic information, learning styles/preferences, technology skills and motivation. Among these, the greatest attention has been given to teaching and learning (i.e., interaction) backed by both empirical and position papers (Flottemesch, 2000; Harasim, 1987; IHEP, 2000). However, the field is not still clear about the construct and influence of interactions. Various claims made about the importance of interactions are largely based on the learners' perception data or the researchers' teaching philosophy. The researchers also find that interaction studies tend to disregard the collective influence of learner-related variables and instructional conditions on course outcomes. Despite the conceptual alignment among learner characteristics, instructional conditions, and other learner variables such as learning motivation and involvement for improved course quality, past studies of learner and instructional variables largely examined simple correlations between learner backgrounds with course participation and/or satisfaction (Simpson & Du, 2004; Patrick & Mohamed, 2005). Few studies have utilized integrated approaches and examined the empirical assessment of the influence of diverse instructional and learner variables on course outcomes within online learning environment. The need to identify the mediating mechanisms to link contextual features influencing course outcomes has been pressing research interest among researchers. Also, the literature of training transfer within Human Resource Development (HRD) shows that course outcomes are more accountable when knowledge gains and applications are demanded at the same time, while course structures provide ample practices and learner support. In view of this, current study examining the influence of core input variables (i.e., instructional variables, learner characteristics, study habits) on the various outcomes of online courses is considered an important research endeavor to address several issues to improve existing online instructional practices.

Literature Review

Variable relationships in learner characteristics studies are not consistent. For example, in Contreras' study (2004), *self-confidence* in using computers was predicted by demographic variables, such as age, gender, ethnicity, socio-economic status, and geographic region. In another study, the same construct was used to predict the student's course performance (DeTure, 2004). However, this kind of methodological approach makes it difficult to compare the result across studies. Therefore, we grouped studies examined similar variables together.

To start with learner characteristics, Simpson and Du (2004) reported that learning style was statistically significant (R^2 = .125, p<.01) to predict course satisfaction using the Kolb's Learning Style Inventory. In demographic variables, gender was most frequently examined. In a study, female students reported more belonging-feeling toward the learner and the social community reporting greater knowledge gains (Rovai & Baker, 2005). More female adult learners of community college online courses said that their course experiences were positive (Sullivan, 2001). Within a medical post-graduate student group, male students submitted more formal and lengthier messages compared to those of their counterparts (Taplin & Jegede, 2001). In some cases, gender was not a significant factor to predict the learners' self-confidence in using computers (Contreras, 2004) and the use of the computers and the Internet (Atan, Sulaiman, Rahman, & Idrus, 2004). Contreras (2004) reported that previous computer experiences and numbers of online courses taken during the semester better predicted the students' confidence in using computers (R^2 = .118, .034, p<.05).

Learner support, such as online tutors, counselors, and student clubs, was another variable reported as significant factors affecting the quality of online education (Huett, Moller, & Young, 2004; LaPadula, 2004). Studies also reported that learning activities, such as group conferencing helped adult online learners become more self-directed (Lee & Gibson, 2003). Sankaran and Bui (2001) stated that online learners who used undirected strategies performed poorer than those who used 'deep' or 'surface' strategies, such as taking notes or practicing exercises. They also informed that less motivated learners did not perform on knowledge tests as well as motivated students. Study skills, such as study groups and contacts with the instructor were reported as positively contributing to student success (King, Harner, & Brown, 2000). From a review of the literature, we classified numerous course-affecting variables and course outcome variables into four categories: learner characteristics, study habits, instructional variables, and course outcomes. Table 1 presents the study variables we included in our study.

Table 1. *Operational Variables for the Current Study*

Learner characteristics	*Learner strategies (study habit)*
- Gender - Age	- Browsing pattern
- Distance learning experience	- Frequency of interruption during study
- Online learning preference over classroom	- Procrastination tendency
- Work status	- Print of web content
Instructional variables	*Course outcomes*
- Instructor quality - Learning activities	- Course satisfaction
- Learning support - Learning motivation	- Learning gains (before and after)
- Learning involvement - Study workload	- Learning application

Purpose and Methodology

Purpose

The purpose of this research study was to examine how online learners were different in instructional variables and course outcomes based on learner characteristics and study habits. Also this study purported to identify what variables in learner characteristics, study habits, and instructional variables affected the online learners' satisfaction with the course, their perceived learning, and perceived application for an online course. Research questions were:

1. Do learners show significant differences in instructional variables and course outcomes based on learner characteristics and study habits?
2. What variables in learner characteristics, study habits, and instructional variables influence course outcomes?

Sample

In order to address the research questions, a group of HRD undergraduate students were asked to participate in this study. The subjects for the study included 125 students (39 male and 86 female) who took a program evaluation course at a southeastern university. Regarding employment status, 30 students were fulltime students, 59 students had part-time jobs, and 36 students had fulltime jobs. The students took the whole course online except two classroom meetings (course orientation at the beginning and project presentation meeting at the end of the semester).

The online course included thirteen learning modules and the workload of one module was equivalent to that of one week's classroom instruction. Four sub-learning sections comprised one learning module. Learning modules provided subject content in learner and program evaluation and various types of media such as texts, graphics, tables, audio and video clips were used to effectively deliver the learning content to the students. The course used the Blackboard system to deliver the learning content to online learners and utilized various learning activities and assignments including group discussions, virtual case studies, pre/post tests, review quizzes, weekly assignments, and group and individual project to provide the learners with opportunities to apply learned content during learning. During the first class meeting, all learners were divided into peer groups composed of three to five learners who were involved in a group project and various online discussion activities for group engagement and learning.

Data Collection and Analysis

An online questionnaire was developed to obtain the data about course outcomes (learners' perceived degree of learning, learning application), perceived instructional quality, perceived workload, and learning involvement during their study. The questionnaire included question items using a five point Likert-type scale to measure the perceived degree of learning (1=do not understand to 5=completely understand) and perceived application of learning (1=none to 5=frequently use) of the eighteen performance objectives of the course. This study also administered a performance test set to assess the learners' learning gain before and after each semester. Regarding learner's learning motivation, this study administered another questionnaire asking each learner's level of learning motivation sustained during the study. The motivation questionnaire included 24 question items in the areas of course relevancy, course interest, affect/emotion, reinforcement, learner control, and self-efficacy and utilized a five point Likert-type scale (1=strongly disagree to 5=strongly agree). Overall, the reliability alphas were: .95 for the perceived learning, .93 for the learning application, and .70 for the performance test in course outcomes; .92 for the instructor quality, .73 for the learning activity, and .91 for the learning support in instructional factors; and .65 for the general workload, .81 for the learning involvement, and .90 for the learning motivation in learner factors, respectively. To collect the pre and post survey data, the learners were asked to participate in the surveys conducted online at the beginning and at the end of each semester.

Basic descriptive statistics were used to analyze the population mean scores in the perceived degree of learning, performance test, perceived application of learning, instructional quality, learning involvement, and learning motivation responded by all learners. Pearson's correlations were calculated to test inter relationships between course outcomes and other learner and instructional variables. ANOVA was run to detect the difference in course outcomes based on learner characteristics and study habits. Regression analysis was conducted to assess the influence of learner and instructional variables on the course outcomes.

Findings

Differences in Learner Variables and Course Outcomes Based on Learner Characteristics and Study Habits

For the purpose of this study, the researchers categorized learner characteristics into gender, age, distance learning experience, online learning preference, and work status and study habits into learners' browsing pattern during online learning, procrastination in learning, printing of web content, learning interruption during online learning. From the data analysis, the learners with different learner characteristics and study habits seemed to have different course outcomes and perceptions about the instructional quality and learning involvement and motivation. First, gender was not indicated as a learner variable differentiating online learners' learning satisfaction and learning outcomes in this study. The mean scores of all course outcomes, instructional, and learner variables were not significantly different between male and female learners. For age, learners between 20-29 years old appeared to have significantly higher mean scores in learning gain, posttest, learning activity, and learning support than other age group learners as shown in Table 4. For learners with distance learning experience, they seemed to have a significantly lower learning motivation mean score and less satisfied with the learning support than those who didn't have distance learning experience. Regarding online learning preference, those learners who preferred online learning method showed significantly higher mean scores for course satisfaction, posttest, learning increase, learning application, instructor quality, learning activity, learning motivation, and learning involvement than those who did not. For study habits, learners with browsing the online learning content from the very beginning page indicated a significantly higher mean score for general workload of the course than other learner groups who browsed the learning content from the whole to interested part and from the whole to the first part respectively. Interestingly, those learners who printed the online learning materials indicated significantly higher mean scores in course satisfaction, general workload, and learning involvement than those who were not. In our study, learners with procrastination tendency showed significantly lower mean scores for course satisfaction, posttest, learning increase, learning motivation, and learning involvement than those learners without procrastination. Tables 2 and 3 present the learners' respective mean and standard error scores based on learner characteristics and study habits.

Table 2. *Mean and Standard Error Scores by Learner Characteristics*

Category	*Sub category*	*N*	*Course Outcomes*			*Instructional Quality*			*Learner Factors*		
			Course Satisfaction	*Learning Increase*	*Learning Application*	*Instructor Quality*	*Learning Activity*	*Learning Support*	*Study Load*	*Learning Motivation*	*Learning Involvement*
Gender	Male	39	3.57 (.83)	3.05 (3.77)	3.73 (.71)	3.59 (1.05)	4.89 (3.30)	3.73 (.93)	3.59 (.85)	3.92 (.59)	3.62 (.89)
	Female	86	3.62 (.76)	2.52 (3.74)	3.61 (.57)	3.70 (1.00)	6.11 (3.41)	3.60 (.89)	3.62 (.80)	3.75 (.71)	3.69 (.85)
Age	18-19	87	3.53 (.85)	2.17 (3.31)	3.65 (.64)	3.62 (1.11)	3.43 (.95)	3.51 (.95)	3.62 (.85)	3.78 (.67)	3.60 (.97)
	20-29	27	3.88 (.41)	4.59 (3.92)	3.64 (.57)	3.83 (.66)	4.00 (.49)	4.02 (.70)	3.48 (.70)	4.00 (.66)	3.85 (.44)
	30 or older	11	3.55 (.73)	2.09 (5.15)	3.64 (.61)	3.61 (.95)	3.68 (.90)	3.76 (.62)	3.91 (.77)	3.39 (.60)	3.70 (.72)
Distance Learning Experience	Yes	99	3.61 (.75)	2.47 (3.76)	3.66 (.62)	3.66 (1.03)	3.55 (.92)	3.55 (.93)	3.67 (.78)	3.73 (.71)	3.68 (.81)
	No	26	3.59 (.89)	3.50 (3.60)	3.60 (.63)	3.71 (.99)	3.65 (.80)	3.98 (.71)	3.38 (.91)	4.05 (.46)	3.60 (1.03)
Online Learning Preference	Classroom	39	3.23 (.97)	1.41 (3.38)	3.41 (.57)	3.28 (1.14)	3.32 (.98)	3.52 (.94)	3.67 (.93)	3.43 (.69)	3.25 (1.06)
	Online	85	3.78 (.61)	3.31 (3.77)	3.78 (.58)	3.84 (.91)	3.68 (.84)	3.70 (.88)	3.58 (.77)	3.96 (.61)	3.85 (.68)
Work Status	Full	36	3.68 (.62)	3.39 (3.79)	3.62 (.58)	3.76 (.99)	3.71 (.71)	3.87 (.77)	3.65 (.75)	3.73 (.67)	3.75 (.69)
	Part time	59	3.62 (.79)	2.83 (3.33)	3.67 (.65)	3.64 (1.04)	3.53 (.93)	3.62 (.85)	3.58 (.83)	3.83 (.74)	3.70 (.84)
	Not employed	30	3.48 (.92)	1.57 (4.28)	3.64 (.61)	3.59 (1.01)	3.57 (.90)	3.40 (1.09)	3.62 (.89)	3.80 (.67)	3.49 (1.06)

Table 3. *Mean and Standard Error Scores by Study Habits*

Category	*Sub category*	*N*	*Course Outcomes*			*Instructional Quality*			*Learner Factors*		
			Course Satisfaction	*Learning Increase*	*Learning Application*	*Instructor Quality*	*Learning Activity*	*Learning Support*	*Study Load*	*Learning Motivation*	*Learning Involvement*
Browsing Pattern*	WI	17	3.31 (.93)	2.18 (2.51)	3.65 (.72)	3.32 (1.17)	3.31 (.79)	3.63 (.95)	3.09 (.94)	3.54 (.78)	3.37 (1.06)
	WF	43	3.80 (.65)	2.72 (3.31)	3.73 (.50)	3.88 (.93)	3.77 (.82)	3.69 (.77)	3.71 (.64)	3.93 (.60)	3.38 (.66)
	FF	61	3.55 (.80)	2.84 (4.29)	3.62 (.63)	3.61 (1.02)	3.50 (.96)	3.59 (.98)	3.68 (.85)	3.78 (.68)	3.61 (.92)
Procrasti-nation	Yes	66	3.46 (.89)	2.02 (3.48)	3.58(.63)	3.51 (1.12)	3.45 (.96)	3.54 (1.00)	3.63 (.87)	3.64 (.73)	3.47 (.98)
	No	58	3.78 (.59)	3.50 (3.91)	3.76 (.56)	3.85 (.85)	3.71 (.81)	3.76 (.76)	3.59 (.76)	3.96 (.57)	3.88 (.66)
Material Printing	Yes	82	3.74 (.67)	2.84 (4.16)	3.72 (.58)	3.75 (1.00)	3.57 (.90)	3.54 (.93)	3.78 (66)	3.82 (.68)	3.80 (.73)
	No	42	3.35 (.91)	2.45 (2.80)	3.55 (.64)	3.50 (1.04)	3.56 (.91)	3.84 (.82)	3.29 (1.00)	3.77 (.68)	3.40 (1.03)
Learning Interruption	Yes	42	3.58 (.84)	2.71 (3.13)	3.73 (.53)	3.65 (1.02)	3.60 (.84)	3.62 (.94)	3.57 (.80)	3.68 (.71)	3.67 (.91)
	No	82	3.62 (.75)	2.71 (4.04)	3.62 (.63)	3.07 (1.02)	3.55 (.93)	3.65 (.47)	3.63 (.83)	3.87 (.65)	3.66 (.85)

* Learners' study habits in reading online learning content (WI-Whole content then interested ones, WF-Whole content then the 1st page, FF-From the 1st page).

Table 4. *ANOVA Results According to Learner Characteristics and Study Habits*

Category	*Study variables*	*Subcategory*	*N*	*Mean (SD)*	*p-value*
Age	Learning increase	18-19	87	2.17 (3.31)	.010
		20-29	27	4.59 (3.92)	
		30 or older	11	2.09 (5.15)	
	Posttest	18-19	87	10.67 (3.37)	.048
		20-29	27	12.56 (3.53)	
		30 or older	11	11.60 (4.12)	
	Learning activity	18-19	87	3.43 (.95)	.015
		20-29	26	4.00 (.49)	
		30 or older	11	3.68 (.90)	
	Learning support	18-19	87	3.51 (.95)	.029
		20-29	27	4.02 (.70)	
		30 or older	11	3.76 (.62)	
Distance learning experience	Learning support	Yes	99	3.55 (.93)	.032
		No	26	3.98 (.71)	
	Learning motivation	Yes	79	3.73 (.71)	.046
		No	23	4.05 (.46)	
Online learning preference	Course satisfaction	Online	85	3.78 (.61)	<.001
		Classroom	39	3.23 (.97)	
	Posttest	Online	84	11.69 (3,47)	.013
		Classroom	37	9.97 (3.41)	
	Learning increase	Online	85	3.31 (3.77)	.008
		Classroom	39	1.41 (3.37)	
	Application	Online	85	3.78 (.58)	.001
		Classroom	39	3.41 (.57)	
	Instructor quality	Online	85	3.84 (.91)	.004
		Classroom	39	3.28 (1.14)	
	Learning activity	Online	84	3.68 (.84)	.036
		Classroom	39	3.32 (.98)	
	Learning motivation	Online	72	3.96 (.61)	<.001
		Classroom	30	3.43 (.69)	
	Learning involvement	Online	85	3.85 (.68)	<.001
		Classroom	39	3.25 (1.06)	
Browsing pattern	General workload	WI	17	3.09 (.93)	.017
		WF	43	3.71 (.64)	
		FF	63	3.68 (.85)	
Material printing	Course satisfaction	Yes	82	3.74 (.67)	.007
		No	42	3.35 (.91)	
	General workload	Yes	82	3.78 (.66)	.001
		No	42	3.29 (1.00)	
	Learning involvement	Yes	82	3.80 (.73)	.014
		No	42	3.40 (1.04)	
Procrastination	Course satisfaction	Yes	66	3.46 (.89)	.023
		No	58	3.78 (.59)	
	Posttest	Yes	64	10.45 (3.24)	.004
		No	57	11.96 (3.70)	
	Learning increase	Yes	66	2.02 (3.48)	.027
		No	58	3.50 (3.91)	
	Learning motivation	Yes	50	3.64 (.73)	.013
		No	52	3.96 (.57)	
	Learning involvement	Yes	66	3.47 (.98)	.008
		No	58	3.88 (.66)	

Influence of Instructional and Learner Variables on Course Outcomes

In analyzing the relationships between instructional and learner factors and the course outcomes, several meaningful findings were obtained. First, the learners' mean score of satisfaction with the online course was significantly related with their mean scores in instructor quality, learning activity, learning support, learning motivation, and learning involvement except the general workload. Second, the learners' perceived learning mean score was significantly related with the mean scores in learners' learning motivation and involvement. Similarly, the learners' mean score of perceived learning application was significantly related with the mean scores of learning motivation and involvement. The mean scores of posttest and learning increase, however, didn't indicate any significant relationships with the instructional and learner variables. Table 5 reports the analysis results.

Table 5. *Correlations between Learning Outcomes and Instructional and Learner Factors*

	Instructor quality	*Learning Activity*	*Learning Support*	*General Workload*	*Learning Motivation*	*Learning Involvement*
Course satisfaction	.614**	.606**	.371**	.096	.305**	.919**
Perceived learning	.170	.061	.121	.112	.556**	.263**
Posttest	-.041	-.059	-.084	-.132	.144	-.061
Learning increase	-.034	-.021	.019	-.171	.130	.021
Perceived application	.174	.069	.099	.137	.436**	.230**

* $p<.05$, ** $p<.01$ (Two-tailed tests)

While the method of correlation analysis has been widely used to detect specific relationships between study variables, researchers have previously recommended using multiple regression analyses to establish the relative predictive importance of the independent variables (Allison, 1999). In our study, we performed stepwise regression because this method is used in the exploratory phase of research (Kahane, 2001). When we conducted the stepwise regression, the findings about the influence of instructional and learner variables on course outcomes were consolidated around three variables. For course satisfaction, two variables in instructor quality and learning involvement explained 84% of the total variation to explain the effect of two variables on course outcomes. Regarding the learners' perceived learning, learning motivation explained about 37% of the total variation. Likewise, learning motivation also explained about 28% of the total variation for the learners' perceived learning application. From this analysis, it was identified that instructor quality, learning motivation, and learning involvement were those influential variables predicting some dependent variables in course outcomes (see Table 6).

Table 6. *Stepwise Regression for Course Outcomes*

Course Outcomes	R^2	δR^2	*Predictors*	β
Course satisfaction	.840	.827	Learning involvement Instructor quality	.683*** .125*
Perceived learning	.373	.314	Learning motivation	.382***
Perceived learning application	.284	.217	Learning motivation	.313***

* $p<.05$, *** $p<.001$

Implications and Contributions to HRD

Among the several findings of this study, age was identified as an important variable indicating differences in course outcomes and learners' instructional perceptions about online learning. Learners between 20-29 years old who had more immediate needs to use the learning content to their current or future studies and jobs seemed to perform significantly better in their performance test and feel much more satisfied with instructional quality of the online course. However, gender seemed not to be a differentiating variable for our study as similar findings were replicated from other studies (i.e., no difference in the use and self-confidence in using computers during online learning) (Atan, Sulaiman, Rahman, & Idrus, 2004; Contreras, 2004). Rather, in our study, online learners' prior experience

with distance learning was identified as more influential variable explaining meaningful differences in learning support and learning motivation. Parallel findings were noted from other studies, too (Huett, Moller, & Young, 2004; LaPadula, 2004). Some significant findings of this study, however, are related with online learners' learning styles and study habits. First, online learners' preference of online learning method compared to classroom instruction was appeared to be an important learner variable making significant differences in course outcomes, instructional perceptions, and learning motivation and involvement from this study. Regarding study habits, this study found that online learners' study habits or skills affected the perceived quality of online learning experience and learning outcomes. Especially, online learners' procrastination tendency was identified as an important variable making differences in course satisfaction, posttest mean scores, learning increase, and learning motivation and involvement. Regarding online learners' learning strategy to study online learning material, this study revealed an interesting finding. In the browsing pattern of online learners, those learners without any strategy (who just start reading from the very beginning) seemed to experience more study workload than those who had certain learning strategy. To address this kind of various learning issues occurred in online learning environment, instructors and instructional designers are strongly recommended to use valid instructional strategies to satisfy online learners' learning styles and promote more meaningful engagement during online learning. For example, the Institute of Higher Education Policy (2000) suggests several guidelines to address these issues in online learning design: (a) a reliable and fail-safe technology delivery system, (b) clear guidelines for class assignments and faculty feedback, (c) appropriate technology standards to deliver instruction, (d) meaningful learning experiences to demonstrate students' ability of analysis, synthesis, and evaluation of learning content, (e) facilitated interaction among students and between students and faculty, (f) facilitation of student self-motivation and commitment, and (g) access to adequate technical assistance and orientation prior to the course.

In analyzing the effect of instructional and learner variables on course outcomes, the study findings indicated that those learners who were satisfied with instructional factors such as instructor quality, learning activity, and learning support were also satisfied with the online course as a whole while those who experienced more study workload were less satisfied with the online course. For learning outcomes, those online learners with high learning motivation and involvement seemed to have better results in perceived learning and learning application. Online learners' learning motivation and involvement were also significantly correlated with their satisfaction with the online course. From these findings, the researchers could conclude that the learning outcomes of online learning seemed to be mostly affected by online learners' motivation and involvement rather than instructional variables. This conclusion is also supported by the study findings from the regression analysis indicating that the course outcomes were significantly influenced by learners' learning motivation and involvement in the learning process. In order to provide more learning engagement and promote learning motivation for online learners, Lim (2004) suggested several instructional strategies: (a) providing timely and frequent feedback to engage students in the learning process, (b) facilitating direct communication experience among students and with instructors through alternative communication channels such as chat, threaded discussion, and audio/video conferencing, and (c) embedding some rewarding mechanisms other than grades during online instruction (e.g., checking students' learning progresses and sending frequent emails for feedback and encouragement and sharing good examples of assignments accomplishments with peer learners).

The contribution of this study to HRD researchers and practitioners is three-fold. First, researchers and practitioners of HRD can utilize the study findings about when and how online learner are satisfied with online courses in designing more learner oriented online programs. For example, it is an important task identifying learners' immediate needs for learning, prior online learning experience, and preference of online learning method to customize online learning programs to meet online learners' needs. Second, current study identified two meaningful variables (learning motivation and learning involvement) and their mediating mechanism to influence learning outcomes for an online learning program. This finding is believed to become an important clue for instructional designers and instructors to develop outcome oriented online instruction. Third, the researchers provided several viable instructional strategies to address those study variables in online learning influential to learner satisfaction and learning outcomes.

Future Study and Limitations

This study has identified several meaningful findings and the mediating mechanisms about the influence of instructional and learner variables on an online course. While many research studies were considered scattered in nature by focusing only one or two learner or instructional variables in the study scope, this study utilized integrated approach to identify the effect of multiple learner and instructional variables on online learning. One limitation of this research study was, however, that this study utilized online learners' perception data to assess the course

outcomes as part of data collection. The selection and size of the study subjects may also limit the generalization of the study findings. We collected the data from a group of undergraduate students who took an online course within a university learning environment. For generalization, future studies to investigate similar construct with a more broad population in different learning environment are warranted.

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