

Analysis of User Satisfaction with Collegiate E-Learning and its Determinants

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Abstract

The benefits of an e-learning system will not be maximized unless learners use the system. This study proposed and tested models that seek to explain students' satisfaction with e-learning systems. A survey was performed at a women's college in Korea, where students experimentally could choose to register one same course either through e-learning or class-room learning. The questionnaire was filled up by students who took e-learning option. Independent variables include expected benefits, familiarity with technology, social influence, and accessibility. Dependent variables include the level of satisfaction, academic achievement, and the amount of the use of systems.

Keywords : e-Learning, User Satisfaction, Learning Performance, Satisfaction Determinant

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1. Introduction

An ideal provision of education is to make it available wherever and whenever students are prepared to learn. The developments in computers and electronic communications have provided us with an expanded potential to removed traditional barriers of space and time so that we can obtain and deliver knowledge virtually any-time anywhere (Horton, 2000).

One benefit of e-learning is that teachers and students do not have to stay at the same time in the same place. In order to make students use the learning opportunity at their own convenience, most e-learning programs today take the form of asynchronous mode delivery. Asynchronous e-learning includes pre-recorded contents which is available to students at any-time of a day. Lessons can be delivered to any remote places with computer access such as home, office, or hotel rooms 24 hours 7 days a week (Rosenberg, 2001). The development of e-learning products and the provision of e-learning opportunities are the most rapidly expanding areas among all educational and training services. When effectively use, e-learning is considered to have a potential to improve the quality of learning, the access to education and training, and the cost and cost-effectiveness of education (Alexander, 2001).

Due to such relative advantages of e-learning, many on-campus colleges now experimentally adopt the use of on-line course delivery along with traditional class-room learning. However, despite such initiatives, early adoptions of e-learning do not show enough returns from early

investments from the perspective of students' responses. A more systematic understanding is required on the behavior and responses of students as users of e-learning.

Although many studies have been attempted on user satisfaction in the field of MIS, research on user satisfaction with regard to e-learning has not been often reported. For this reason, we specifically focus on user satisfaction and the related precedent variables in e-learning in this research. This research reports the results of an analysis of factors that influence the level of satisfaction. In addition, one unique aspect of this research is that we employed not only perceptual outcomes like satisfaction, but we also included academic record of students as achievements from learning as a part of dependent variables. Due to a unique research setting of this research, this survey study could take the form of quasi field experiment. The inclusion of such non-perceptual evaluation is considered to strengthen the results of research.

2. Theoretical Background

2.1 User Information Satisfaction

Research on the satisfaction of the users of information systems, or UIS (User Information Satisfaction) has a long tradition in the field of Management Information Systems (Bailey and Pearson, 1983; Ives, Olson and Baroudi, 1983; Doll and Torkzadeh, 1988). UIS is one of the major dependent variables in research on the use, adoption, and diffusion of information systems. The use of information systems is a

prerequisite condition to develop the attitude of users on the systems. And the UIS is the key aspect of users' attitude toward information systems (Melone, 1990; Hiltz and Johnson, 1990). On the other hand a high level of satisfaction is one major determinant that triggers a high level of the use of information systems. For this reason, UIS and use influence reciprocally. Use and adoption create users' satisfaction, and satisfaction influences use. One major stream of research on the use and adoption of information technology follows the technology acceptance model (TAM) suggested by Davis(1989).

3. Factors that influence user satisfaction with information systems

E-learning is a mechanism of learning where educational contents are provided via information and communication technology. For this

reason, students play the role of learners on the one hand and the role of IS users on the other. An e-learning system is one complete form of information systems which include information and content storage, user interface, delivery and communication method, authoring and learning support software, and proper platforms and hardware. In this regard, a review of factors that affect user's satisfaction with information systems can help us to explore the list of factors that affect the level of satisfaction of e-learning users.

According to existing research on information user satisfaction (UIS) in IS research, there are several characteristics of information systems that determine the level of users' satisfaction. For example, DeLone and McLean (1992) identify six major dimensions of IS success system quality, information quality, use, user satisfaction, individual impact, and organizational impact. They further develop a model of Information System success, which describes the inter-

<Table 1> Selected Factors that Affect Satisfaction with Information system

Factors Extracted	Variables Included	Author
characteristics of individual : attitude and cognition of use, age, gender, position, level of education, experience of using compute, individual influence. characteristics of organization : support from employer, characteristics of tasks, organizational influence	individual attitude toward an object play, attitude and cognition of use, support from employer, system quality, characteristics of decision making, human and context factors	Lucas (1978)
	attribute of user, system quality, support from employer, participation and training, human factors	Bruwer (1984)
	system quality, information quality, frequency of using, user satisfaction, individual influence, organization influence	Delone and McLean (1992), Pitt, Watson and Kavan (1995)
	perceived benefit (user expectation, ease of use in using, perceived usefulness), user characteristics (experience of user and the level of skill, user participation on system development), support by organization(attribute of support from employer)	Mahmood et al. (2000)

relationship among these constructs. According to the model the quality of systems and services are important factors that affect user satisfaction. <Table 1> summarizes representative factors employed in existing research that determine the level of user satisfaction with information systems.

3.1 Service Quality

E-learning is basically the provision of a service, an educational service. In this regard, a review of selected literature on the quality of service is essential. The quality of service is considered to be the central research issue, which is closely related to the level of satisfaction.

The most popular diagnostic tool for analyzing service quality is SERVQUAL. In both Kettinger and Lee (1994) and Pitt and Watson (1995, 1997)'s research, the conceptual emphasis was placed on service quality within the area of IS evaluation by empirically analyzing determinations of IS services using SERVQUAL dimensions. Kettinger and Lee (1994) reviewed theories related to SERVQUAL focusing on the field of quality management and consumer satisfaction research. And they focused on the actual value of the implement's flexibility in the IS field. Pitt, Watson, Kavan (1995, 1997) extended the application of SERVQUAL's reliability and validity to samples in three different organizations. These papers touched on questions related to the use of "gap" scores and potential problems in the SERVQUAL "expectation" measure. These researches can be accom-

plished by two approaches. The first is that by careful reexamination of content validity, such as the development of underlying theory and the operationalization of items. And the second is that by a parsimonious refinement using the specification search techniques of confirmatory factor analysis on the original 22 items.

3.2 Social Influence

Although UIS is a major determinant of the level of use of information systems at the level individual user given that the use of the system is discretionary, users do not behave in isolation. The adoption and use of a technology is not fully determined by the attitude and judgment of an individual. The use is also influenced by the pressure from peers, subordinates, superordinates and members of different sub-communities. In case of collegiate e-learning, we expect that the influence of peer group and friends should be significant. Even though, the level of intention of one student to take e-learning course is not very high, he/she can take the course due to the critique and recommendation from close friends and class-mates. Researchers in the stream of social influence paradigm emphasize the importance of such social context.

4. Research Model

Base on the different streams of research we reviewed in the previous chapter, we suggest a model on factors of user satisfaction in e-learning. This model is based especially on the model of Mahmood et al. (2000) and in-

corporated additional variables appeared in various research such as DeLone and McLean (1992), Pitt et al. (1995) in addition to the considerations centered around e-learning environment. The research model have four independent variables which are expected to influence satisfaction such as expected efficacy (utility) related to time saving, expected efficacy related to learning performance, the level of technical familiarity, social influence, and e-learning accessibility. Three dependent variables are the level of learning performance (grade), the level of the user satisfaction, and the amount of use. The model is summarized in <Figure 1> and the related hypotheses are as follows :

4.1 Research Hypotheses :

Hypothesis 1-1 : The expected temporal utility of e-learning systems is positively related to the level of user satisfaction.

Hypothesis 1-2 : The expected usefulness of e-learning systems for study performance is positively related to the level of user satisfaction.

Hypothesis 1-3 : The level of technical familiarity is positively related to the level of user satisfaction.

Hypothesis 1-4 : The level of social influence in using e-learning is positively related to the level of user satisfaction.

Hypothesis 1-5 : E-learning accessibility is positively related to the lev-

el of user satisfaction.

Hypothesis 2-1 : The expected temporal utility of e-learning systems is positively related to the level of study achievement.

Hypothesis 2-2 : The expected usefulness of e-learning systems for study performance is positively related to the level of study achievement.

Hypothesis 2-3 : The level of technical familiarity is positively related to the level of study achievement.

Hypothesis 2-4 : The level of social influence in using e-learning is positively related to the level of study achievement.

Hypothesis 2-5 : E-learning accessibility is positively related to the level of study achievement.

Hypothesis 3-1 : The expected temporal utility of e-learning systems is positively related to the level of use.

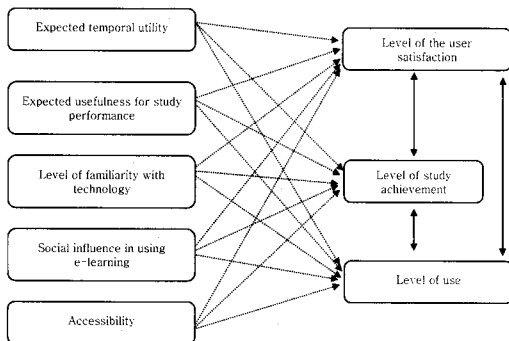
Hypothesis 3-2 : The expected usefulness of e-learning systems for study performance is positively related to the level of use.

Hypothesis 3-3 : The level of technical familiarity is positively related to the level of use.

Hypothesis 3-4 : The level of social influence in using e-learning is positively related to the level of

use.

Hypothesis 3-5 : E-learning accessibility is positively related to the level of use.



<Figure 1> Research Model

5. Instruments Used

All variables except academic achievement are measured using 5-point Likert-type perceptual scale. Academic achievement is the actual grade score of the course taken.

5.1 Expected temporal utility

Based on Mahmood et al. (2000) and Kelsey et al. (2002) we modeled that the level of expected utility in terms of the use of time is an important determinant to the level of use, user satisfaction, and achievement. The temporal utility expectation includes students' expectation to use and allocate their time more efficiently, to control their time more effectively, to control the speed of learning, and to repeat learning when needed. Expected temporal utility was measured using 4 items of 5-point Likert-type scale

5.2 Expected usefulness for study performance

Lynman (1998) suggests that learners' expectation on the achievement from learning influence the behavior of users who take courses from e-learning. The usefulness is operationalized as 4 items; the level of achieving learning goal, the expected intensity of learning, expected learning progress, and the level of expected convenience of learning (Rosenberg, 2001 Bruwer, 1984).

5.3 The level of familiarity with technology

Because e-learning delivers learning contents through advanced information technology, the level of technological skill and familiarity may increase or decrease users' satisfaction. Cloete (2001)'s research on the effect of computer users' self-efficacy and familiarity to the technology on their level of satisfaction implies that the technical familiarity plays an important role in e-learning context. Based on existing research we used 4 items to measure technical familiarity : familiarity to computer environment, self-evaluated computer use ability, familiarity with the procedure and skill to use e-learning site, intention to use computer actively (Carley, 1996 Urban, 2000 Cloete, 2001 Thurmond et al., 2002).

5.4 Social influence in using e-learning

When students make a judgment on the registration of e-learning course, they tend to collect information and opinion from people around.

People who are connected through social network play important and influential roles in the choice, adoption, and use of a technology especially the technology is new and less-familiar (Rathneshwar and Chaiken, 1991). Sometimes one's hope and intention to maintain social bondage drive them to respect opinions of the peer group. On the other side, peer influence works as a pressure. To avoid isolation and maintain coherence, people use new technology against their personal preference. Review of existing research shows that there are about 6 items we need to include for the purpose of this research on e-learning recognition from peers, non-isolation from peer group, maintenance of intimate relationship with close friends, recommendation by peers, communications among peers, and exchange of opinion among friends (Rathneshwar and Chaiken, 1991).

5.5 E-learning accessibility

Volery (2001) emphasize the importance of accessibility to e-learning. When the level of convenience to access an information system is high, people tend to use the system more intimately. Systems or sites which is convenient and accessible physically and logically have the potential to draw high level of intimacy, attention, exposure, utilization and satisfaction (Urban, 2000 Thurmond et al., 2002). Two items were used to measure accessibility.

5.6 Dependent Variables : Achievement, amount of use and user satisfaction

The most representative surrogate measure of

achievement is GPA and grade obtained from the course (Maier, 2000). According to Thurmond et al. (2002) the amount of use includes 3 items, which we followed to use : how actively the technology is used, how frequently it is used, and how frequently interaction is made.

As mentioned in the previous section, computer user's satisfaction is one of the most researched construct in the field of management. Based on different research on information systems, user behavior, and e-learning we chose to use 10 items to measure the level of satisfaction of the students who use e-learning in our research context; overall level of satisfaction (Anderson, Fornell and Lehmann, 1994), ease of understanding (Allen et al., 2002), satisfaction with time saving and with study results (Churchill et al., 1982), satisfaction with the convenience of learning method (Seddon, 1997), satisfaction based on learning recommendation (Wang, 2003), satisfaction with relative advantage compared to traditional type of lecture (Allen et al., 2002), satisfaction with future value of learning experience (Oliver, 1980).

6. Results

6.1 Participants and procedure

A field experiment was performed at Hanyang Woman' College located at the center of downtown Seoul, Korea. All participants were first and second year female students who had taken literature and practical English courses. The courses were administered in the fall of 2007. Students could choose either off-line lecture or

e-learning for each of the two courses at their own discretion. Out of the 400 students who had taken the two courses, 71 were eliminated due to incomplete data leaving a total of 329 students. Among the completed respondents, 242 students who chose to use e-learning method were selected as research sample. <Table 2> summarizes the profile of the sample. Participants were distributed across diverse majors and their score distribution was also reported.

According to the survey, 78% of the re-

spondents advocated the offering of e-learning courses in basics and humanities courses. However, only 12% replied that they want to take an e-learning course in their major field. The need for the application of e-learning in this sense is centered on elementary courses, which deal with less sophisticated knowledge and skill. 63% of the students used e-learning site for about 30 minutes, 23% used between 30 and 60 minutes. 45% of the respondents said that taking about two to three courses using e-learning

<Table 2> Characteristics of the respondents

Variable		Frequency	Percentage (%)	Variable		Frequency	Percentage (%)
Total number of respondents		242	100	Total number of respondents		242	100
e-learning Course	Writing Skill	99	40.9	Grade	A+ (95~100)	74	30.6
	Practical English	143	59.1		A0 (90~94)	41	16.9
Major	Broadcasting Image Design	29	12		B+ (85~89)	48	19.8
	Internet Informatics	39	16.1		B0 (80~84)	30	12.4
	Pre-school Child education	57	23.6		C+ (75~79)	13	5.4
	English Language	29	12		C0 (70~74)	7	2.9
	Japanese Language	43	17.8		D+ (65~69)	4	1.7
	Chinese Language	22	9.1		D0 (60~64)	7	2.9
	Dental Hygiene	23	9.5		F	18	7.4

<Table 3> Measurement Reliability

Construct	No. of items	Cronbach's alpha
Expected temporal utility	4	0.709
Expected usefulness for study performance	4	0.781
Familiarity with technology	5	0.774
Social influence in using e-learning	6	0.785
E-learning accessibility	2	0.729
Amount of Site use	3	0.76
User satisfaction	12	0.887
Range of Reliability	-	0.709~0.887

would be most preferred.

According to the analysis of reliability and validity of the measures, the Cronbach's Alpha score of the variables produced by SPSS 14.0 ranged between 0.709 and 0.887. This result signifies that all the variables and measures fall nicely within the boundary of usable reliability <Table 3>. In order to see the basic validity of the measurement analysis of the variable structure was performed using principle component analysis using varimax rotation. The result showed that the variable structure conforms to our expectation on content validity <Table 4>.

<Tables 5a>, <Tables 5b>, and <Tables 5c>

are the summary of regression analyses that show the relationship between independent variables and the three dependent variables. <Table 5a> shows results from multiple regression analysis on the level of user satisfaction. The expected temporal utility, the level of technical familiarity and social influence in using e-learning were found to have significant influences. <Table 5b> summarizes results from multiple regression analysis on learning performance. The expected temporal utility was only one independent variable that was found to be significant. As summarized in <Table 5c>, on the other hand, the expected usefulness, the level of

<Table 4> Result of Factor analysis with Varimax Rotation

Variables	1	2	3	4	5	6
Expected temporal utility				0.6570		
				0.7370		
				0.7365		
				0.6526		
Expected usefulness for study performance			0.6032			
			0.7797			
			0.7777			
			0.7672			
Familiarity with technology	0.7921					
	0.8328					
	0.7319					
	0.5359					
	0.6441					
Social Influence I		0.6698				
		0.8842				
		0.8895				
Social influence II					0.6723	
					0.8231	
					0.5483	
Accessibility						0.7589
						0.8953

Note) Extraction Method : Principal Component Analysis.
 Rotation Method : Varimax with Kaiser Normalization.

〈Table 5a〉 Multiple regression analysis on user satisfaction

Dependent variable	Independent variables	B	T	Sig.	
User satisfaction	Constant	0.61	1.798	0.073	
	Expected temporal utility	0.125*	1.932	0.055	Supported
	Expected usefulness	0.042	0.702	0.483	Not Supported
	Familiarity with tech.	0.190**	3.021	0.003	Supported
	Social influence	0.382**	5.669	0.000	Supported
	e-learning accessibility	0.05	0.951	0.343	Not Supported

Note) Model : R Square = .206 Sig. = .000.

〈Table 5b〉 Multiple regression analysis on learning performance

Dependent variable	Independent variables	B	T	Sig.	
The level of study effect	Constant	2.482	3.155	0.002	
	Expected temporal utility	0.286	1.915	0.057	Supported
	Expected usefulness	-0.084	-0.604	0.546	Not Supported
	Familiarity with tech.	-0.208	-1.422	0.156	Not Supported
	Social influence	-0.047	-0.304	0.761	Not Supported
	e-learning accessibility	0.187	1.542	0.124	Not Supported

Note) Model : R Square = .018 Sig. = .038.

〈Table 5c〉 Multiple regression analysis on e-Learning USE

Dependent variable	Independent variables	B	T	Sig.	
The level of e-learning use	Constant	0.251	0.865	0.016	
	Expected usefulness	0.243	4.153	0.000	Supported
	Familiarity with tech.	0.215	3.418	0.008	Supported
	Social influence	0.377	5.452	0.000	Supported

Note) Model : R Square = .201 Sig. = .000.

technical familiarity and social influence in using e-learning were found to be significant. The expected temporal utility, however, was not significant.

7. Conclusion

In the present study it was found that many

factors were known to be influential the expected effect on time aspect of the e-learning system, the level of technical familiarity, social influence in using e-learning and the expected effect on study efficiency of e-learning system. The expected effect on study efficiency of e-learning system did not actually have a significant among these variables. Rather, the level of the

study effect was only affected the expected effect on time aspect of the e-learning system. Further, accessibility to e-learning system did not have significance with any dependent variable.

The result implies that university on e-learning education system should be prepared to collect the student's characters such as attitude of study and style, and have to implement investigating social effects with friends. And more systematically aggressive plan and support is needed to prepare an effective e-learning system to students.

First, social influence, which was not tested in previous research, was found to be an important variable. The level of social influence affects both the satisfaction with e-learning and the amount of use. Students seem to be sensitive to the influence, opinion, and pressure of their peer group. Educators and the managers of e-learning should keep paying attention to both the general response of the students and social networks among students to help them use the new e-learning facility more efficiently and effectively.

Second, our research reconfirmed that students of e-learning assume dual roles : learners and computer users. For this reason, the level of familiarity with computer and internet technology plays an important role. New technologies emerge and the technological skills and functional expectations of users evolve. So, new information systems and new designs can and should be incorporated to continuously improve user friendliness of interfaces of e-learning and the functionality that help students learn the

technology easily and conveniently. Technology education to improve overall familiarity of the students will also contribute to the expansion of the student pull who would take e-learning courses and to the improvement of the level of user satisfaction and use.

Third, different from class-room learning, learners are able to make their own study plans and schedule and control their phase and speed of study, which fits to individual situations and contexts. The learners become more autonomous and independent. According to the results of this study, such sense of temporal control plays a very important role in improving the level of satisfaction. This result implies that the designers of e-learning course should not only care about the quality of the contents but also carefully design the functions that help students to set their study goals and schedules.

References

- [1] Alexander, S., "E-learning developments and experiences", *Education+Training*, Vol. 43, No. 4, 2001, pp. 240-248.
- [2] Allen, M., J. Bourhis, N. Burrell, and E. Mabry, "Comparing student satisfaction with distance education to traditional classrooms in higher education : A meta analysis", *The American Journal of Education*, Vol. 16, No. 2, 2002, pp. 83-97.
- [3] Anderson, E. W., Fornell, C., and Lehmann, D. R., "Customer Satisfaction, Market Share, and Profitability : Findings From Sweden", *Journal of Marketing*, Vol. 58, 1994, pp. 53-66.

- [4] Bailey, J. E. and Pearson, S. W., "Development of a Tool for Measuring and Analyzing Computer User Satisfaction", *Management Science*, Vol. 29, No. 5, 1983, pp. 530-545.
- [5] Bruwer, P., "A descriptive Model of Success for Computer-Based Information System", *Information and Management*, Vol. 7, 1984, pp. 63-67.
- [6] Carley, R., "Survival of Fittest", *Successful Meetings*, Vol. 45, No. 9, 1996, pp. 32-37.
- [7] Churchill G. A. and Supernant, C., "An Investigation into the Determinants of Customer Satisfaction", *Journal of Marketing Research*, Vol. 19, 1982, pp. 491-504.
- [8] Cloete, E., "Electronic Education System Model", *Computers and Education*, Vol. 36, No. 2, 2001, pp. 171-182.
- [9] Davis, F. D., "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology", *MIS Quarterly*, Vol. 13, No. 3, 1989, pp. 319-340.
- [10] DeLone, W. H., and McLean, E. R., "Information System Success : The Quest for the Dependent Variable", *Information Systems Research*, Vol. 3, No. 1, 1992, pp. 60-95.
- [11] Doll, W. J., and Torkzadeh, "The Measurement of End-User Computing Satisfaction", *MIS Quarterly*, Vol. 15, No. 1, 1988, pp. 259-274.
- [12] Hiltz, S. R. and Johnson, K., "User Satisfaction with Computer-Mediated Communication Systems", *Management Science*, Vol. 36, No. 6, 1990, pp. 739-764.
- [13] Horton, W., *Designing Web-based Training*. New York : John Wiley and Sons, 2000.
- [14] Ives, B., Olson, M. E., and Baroudi, J. J., "The Measurement of User Information Satisfaction", *Communications of the ACM*, Vol. 26, No. 10, 1983, pp. 785-793.
- [15] Kelsey, K. D., Lindner, J. R., and Dooley, K. E., "Agricultural education at a distance : Let's hear from the students", *Journal of Agricultural Education*, Vol. 43, No. 4, 2002, pp. 24-32.
- [16] Kettinger, W. J. and Lee, C. C., "Perceived Quality and user Satisfaction with the Information Services Function", *Decision Science*, Vol. 25, No. 5, 1994, pp. 586-603.
- [17] Lucas, H. C., "Empirical Evidence for a Descriptive Model of Implementation", *MIS Quarterly*, Vol. 2, No. 2, 1978, pp. 27-41.
- [18] Lyman, B. G., "Learning strategies for the internet : Playing Catch Up", Proceedings of 1998 Ed-media conference, 1998.
- [19] Mahmood, M. A., Burn, J. M., Gemoets, L. A., and Jacquez, C., "Variables affecting information technology end-user satisfaction : a meta-analysis of the empirical literature", *Int. J. Human-Computer Studies*, Vol. 52, 2000, pp. 751-777.
- [20] Maier, P., and Warren, A., *Integrating Technology in Learning and Teaching*, Kogan Page, London, 2000.
- [21] Melone, N. P., "A Theoretical Assessment of the User-Satisfaction Construct in Information Systems Research", *Management Science*, Vol. 36, No. 1, 1990, pp. 76-91.
- [22] Oliver, R. L., "A Cognitive Model of the antecedents and Consequence of Satisfaction

- Decisions”, *Journal of Marketing Research*, Vol. 17, 1980, pp. 460-469.
- [23] Pitt, L. F., Watson, R. T., and Kavan, C. B., “Service Quality : A Measure of Information Systems Effectiveness”, *MIS Quarterly*, Vol. 19, No. 2, 1995, pp. 173-187.
- [24] Pitt, L. F., Watson, R. T., and Kavan, C. B., “Measuring Information Systems Service Quality : Concerns for a Complete Canvas”, *MIS Quarterly*, Vol. 21, No. 2, 1997, pp. 209-221.
- [25] Ratneshwar, S. and Chaiken, S., “Comprehension’s role in persuasion : The case of its moderating effect on the persuasive impact of source cues”, *Journal of Consumer Research*, Vol. 18, 1991, pp. 52-62.
- [26] Rosenberg, M. J., *e-Learning : Strategies for Delivering Knowledge in the Digital Age*, McGraw-Hill, 2001.
- [27] Seddon, P. B., “A Respecification and Extension of the DeLone and McLean Model of IS Success”, *Information Systems Research*, Vol. 8, No. 3, 1997, pp. 240-253.
- [28] Thurmond, V. A., Wambach, K., Connors, H. R., and Frey, B. B., “Evaluation of student satisfaction : Determining the impact of a web-based environment by controlling for student characteristics”, *The American Journal of Distance Education*, Vol. 16, No. 3, 2002, pp. 169-189.
- [29] Urban, T. A. and Weggen, C. C., *Corporate e-Learning : Exploring a New Frontier*, WR Hambrecht+ Co., March 2000.
- [30] Volery, T., “Online Education : An Exploratory Study into Success Factors”, *Journal of Educational Computing Research*, Vol. 24, No. 1, 2001, pp. 77-92.
- [31] Wang, Y. S., “Assessment of Learner Satisfaction with Asynchronous Electronic Learning Systems”, *Information and Management*, Vol. 41, No. 1, 2003, pp. 75-86.

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