Winter 12-5-2005

Consensus of Corporate E-Learning System Stakeholders Regarding the Satisfaction of End-Users

Jae-Sik Kim

Hee-Dong Yang

Hye-Mi Um

Hye-Seung Kang

Consensus of Corporate E-Learning System Stakeholders Regarding the Satisfaction of End-Users

Jae-Sik kim [1], Hee-Dong Yang[2], Hye-Mi Um[3], Hye-Seung Kang[4],
[1] Samil pricewaterhouseCoopers, Seoul, Korea
Tel: +82-2-3781-9570 e-Mail : jskim@samil.com
[2] (Corresponding author) College of Business Adimin, Ewha Womans University, Seoul, Korea.
Tel: +82-2-3277-3582 e-Mail: hdyang@ewha.ac.kr
[3]College of Business Adimin Ewha Womans University, Seoul, Korea
Tel: +82-2-3277-2777 e-Mail: nabiran@ewhain.net
[4]College of Business Adimin Ewha Womans University, Seoul, Korea
e-Mail: gogodream@chol.com

Abstract: The purpose of this study is to call attention to the consensus of stakeholders of corporate e-Learning system regarding success. We identified the critical success factors (contents, technical features, management, and organizational support) as major components of corporate e-Learning systems and questioned whether stakeholders' consensus on the importance of these components facilitates the implementation of these components to achieve good quality or well. We also questioned whether the influence of these components on user satisfaction could be moderated by contextual factors. Based on empirical testing of 18 e-Learning user companies, we verified that the consensus of stakeholders regarding the importance of content, technological features, and organizational support has a positive influence on the perceived quality of these factors in their e-Learning systems, which in turn is positively related to user satisfaction. The learning subjects and learning style did significantly moderate the influences of these perceived qualities on user satisfaction.

Keywords: e-Learning system stakeholders, consensus of stakeholders, e-Learning user satisfaction.

I. Introduction

Online education systems (or e-Learning systems) have presented possible solutions for many problems arising from off-line-based education and training, such as temporal and spatial limits, and the distinctive benefits unavailable from traditional education systems such as agile updates of content, personalization, interactivity, and timeliness[5]. However, opinion is getting stronger among scholars and practitioners in the human resources development field that we need to be more clearly aware of the diverse views of stakeholders on education and training that can cause either chaos or consistency in the overall structure and efforts of education and training systems [22]. Thus, this study poses the following research questions:

-Who are the stakeholders that render substantial influences on the quality of corporate e-Learning systems?

-What kinds of factors influence the end users' satisfaction with corporate e-Learning systems? Also, are their influences stable or subject to contextual factors?

-What is the role of stakeholder consensus on the quality of such influential factors?

To answer these questions, first we reviewed how previous studies in management approached and investigated the issues regarding stakeholders and then identified three different groups of stakeholders who render substantial influence on corporate e-Learning systems. Second, we explored diverse literature on traditional learning, e-Learning system, and information system (IS) implementation to come up with a list of the influential factors pertaining to end-user satisfaction with e-Learning systems. Third, we developed measurement scales to assess the degree of consensus of the stakeholders regarding the importance of these influential factors and empirically tested how such consensus relates to the quality of implementation of the factors and eventually end-user satisfaction with e-Learning systems.

Further, this study presumes that the effects of these influential factors are susceptible to moderating variables instead of being steady and stable across diverse learning contexts. This study investigates whether the learning subjects and learning style moderate the effects of various influential factors on end-user satisfaction regarding corporate e-Learning systems.

II. Theoretical Framework

II. 1 Stakeholders of e-Learning Systems and Their Consensus

Freeman (1984) [11] defined stakeholders as individuals or organizations that make influences on or are influenced by a company to achieve its goals. Because stakeholders can influence organizational behaviors, decision-making, policies, and goals, companies need to divide the stakeholders into small groups with the same interests and deal with individual idiosyncrasies and demands with each stakeholder group [11]. Recognizing and reflecting the diverse perspectives of stakeholders must be a working strategy to increase cooperative attitudes among stakeholders, reduce risks stemming from stakeholders'

Proceedings of the Fifth International Conference on Electronic Business, Hong Kong, December 5-9, 2005, pp. 355 - 361.

power abuse, and thus predict and control stakeholders' behaviors. Such lessons to relate to cooperative relationship with stakeholders have substantial significance on company education activities: i.e., recognizing all the diverse perspectives of stakeholders in education and training clearly [22]. Although researchers have diverse opinions about the components and stakeholders of e-Learning systems, practitioners and academia in Korea have agreed to classify the stakeholders of corporate e-Learning systems into **learners**, **e-Learning service providers**, and **human resource departments in charge of corporate education**. This study focuses on corporate e-Learning systems.

As previous studies on corporate e-Learning stakeholders are not abounding, we conducted in-depth interviews with e-Learning content developers, producers, service providers, and human resources development officers as well as individual users of e-Learning user companies, and asked all groupings whether the above three categories of stakeholders of e-Learning systems were valid. Through their agreement in this study, we come to confirm the three groups of stakeholders for corporate e-Learning systems.

This study is interested in the role of the prior consensus of stakeholders on the important factors that apply to their corporate e-Learning systems. Our posture is that high consensus among stakeholders on the importance and value of critical success factors of e-Learning systems facilitates actual implementation of those factors in good quality, which in turn leads to user satisfaction. Each stakeholder can also have unique critical issues that are not relevant to other stakeholders (for example, market share of e-Learning system products may matter only for the e-Learning service provider). However, the objective variable of this study is end user satisfaction, and therefore, the influential factors in the study are all limited by their relevancy to end-user satisfaction with e-Learning systems.

Our inference about the role of stakeholders' consensus on the ultimate qualities of e-Learning systems is based on the previous studies that have attributed the success or failure of organizational activities to a consistency and consensus in values, opinions, and significance of organizational stakeholders [24]. The importance of stakeholders' consensus has been highlighted by the theory of "group mind" for the last ten years. Several terms have been used to explain the process in which individuals form a collective sense for their teams, organizations, and environments, and emphasize the importance of agreement or consensus among group members. Particularly, the shared mental model is one of the most widely used terms [18]. The shareness of individual mental models is desirable for team performances because team members can form similar predictions for tasks, acquire the necessary information to complete them, and better adapt to the requests and issues of other teammates [4]. These previous studies insinuate that consensus of stakeholders regarding the importance and value of critical success factors for e-Learning systems can improve the possibility of implementation of those factors and their qualities as well. Thus, what aspects of corporate e-Learning systems do the stakeholders need to appreciate and acknowledge in common to achieve this goal?

II. 2 Influential Factors for the Success of e-Learning System

We examined diverse literature of information systems and education engineering as it regards corporate education, e-Learning, and e-Learning systems in order to identify the influential factors for corporate e-Learning systems. More attention was needed for information systems because new technical features are being continually imported to e-Learning systems, such as Internet, graphics, animations, sounds, images, and color videos. Through the literature review, we agreed on the following four categories of influential factors that produced the success of corporate e-Learning systems: Content, technical features, management (of service providers), and (end-user) organizational support.

Keegan (1986) [15] emphasized the importance of lecture **content** in education. Keegan (1986) [15] and other constructivists proved that the content of multi-media education systems should be valid [17], well-structured [25], and clear and straightforward [23] for good performance and results. Thus, the learning experience can be varied according to how the different learning content is selected, structured, and expressed.

Howell & Silvey (1996) [12] indicated that the performance of multi-media training is deeply related to its **technical characteristics**. The representative metrics include the robustness and trend updates of technical features [21], convenience of system usage [7], and the speed and accessibility of the network [9].

Motivation and interaction are in the realm of e-Learning **management** of education and training service providers that support, encourage, and facilitate learners to continue learning [1]. Keller (1984) [16], who developed the ARCS (Attention, Relevance, Confidence, Satisfaction) Model for motivation development, contended that motivation and feedback are two major factors to obtain effective information system-based education.

Organizational support can be psychological (such as encouragement, recognition, and positive expectations of colleagues, bosses, and management) or materialistic (such as compensation and rewards based on performance of the learners) [1]. Doll (1985) [10] compared the organizational support between successful and failure IS-based education systems and found that successful systems are accompanied by substantial support from top management.

II. 3 Moderators of e-Learning Systems

Through intensive interviews with numerous e-Learning stakeholders, we sensed that e-Learning service providers and human resource departments consider the characteristics of learning subjects in preparing e-Learning programs. They determined different requirements of course load and pre-requisites for learners and different caliber levels and

qualifications for instructors. In addition, structuralism in education has mandated that the diverse learning styles of learners possess different preferences, requirements, and priorities for different learning systems.

The **subjects** of organizational education can be classified into hard and soft skills [20]. Hard skills relate to such issues as information technology, software operations, product knowledge, and task operations, all of which need to be well defined, structured, and closely related to current tasks. Soft skills denote knowledge that cannot be easily articulated or explained, such as personal relationships, courtesy and manners, interview tactics, ethics, and leadership. So far in Korea, thee-Learning programs of most companies have been focused on hard skill contents; however, soft skill subjects are steadily increasing. Therefore, this study examines whether the learning subjects moderate the effects of those influential factors mentioned above on user satisfaction with corporate e-Learning systems.

Studies have identified that individual attributes, such as cognitive ability, experience, motivation, attitude, values, and expectation, are deeply involved with the overall effectiveness of traditional corporate educations [19]. Such attributes also exert significant influence on information system-based learning systems [8]. Particularly, we examined individual **learning styles** that possessed the preferences and requirements to complete each course. Due to this innate foundation, we need to identify the role of learning styles on learning and education performance. We propose that e-Learning style correspond to the usage type of decision support systems developed by Inmon et al. (1999) [14] because e-Learning systems require similar interactions to DSS in terms of cognitive challenge and purpose of use. We came up with a binary category for learning style: Exemplary type and whimsical type. These two respectively correspond to the farmer type and the explorer type of Inmon et al. (1999) [14] DSS usage categories of learning type. The exemplary type regularly uses e-Learning systems, clearly recognizes the goals of study, and focuses on the contents delivered through the system. The whimsical type does not regularly access the e-Learning system, is not conscious of the study goals, and searches for more information beyond the course contents whenever they desired or required.

III. Research Model and Hypotheses

We have produced the following four groups of hypotheses. The first group relates to the role of stakeholder consensus regarding the importance and value of the four categories of critical success factors. Critical success factors need to constitute corporate e-Learning systems for desirable performances, so are called e-Learning system components in this study. The second group of hypotheses relates to the relationship among these factors, and we supposed the hierarchical relationship in this regard. The third group of hypotheses reflects the theoretically induced influences of those factors (i.e., e-Learning system components) on the effectiveness of corporate e-Learning systems (i.e., user satisfaction). Finally, the fourth group of hypotheses anticipates the moderating role of the learning subject and the learning style in regards to the effects of those factors.

H 1. The consensus of stakeholders on the importance and value of critical success factors for corporate e-Learning systems positively influences the implementation quality of these factors.

1-1. The consensus of stakeholders on the importance and value of contents positively influences the perceived content quality (PCQ).
1-2. The consensus of stakeholders on the importance and value of technical features positively influences the perceived technical quality (PTQ).
1-3. The consensus of stakeholders on the importance and value of management positively influences the perceived management quality (PMQ).
1-4. The consensus of stakeholders on the importance and value of organizational support positively influences the perceived organizational support quality (POQ).

H 2. The perceived qualities of e-Learning system components are in a hierarchical relationship.

The ultimate quality of e-Learning systems depends on content, and content is the major object to be delivered to organizational members. Therefore, we put PCQ at the high point of the hierarchical relationship. PMQ and PTQ are two direct supporting activities that help learners understand and apply the content, which is the main *raison-d'étre* for any e-Learning system. POQ sets up the organizational mindset, attitude, and direction regarding e-Learning systems, which then buttresses all relevant activities. Therefore, we present the hierarchical relationship among these factors as follows.

2-1. POQ positively influences PTQ.
2-2. POQ positively influences PMQ.
2-3. PTQ positively influences PCQ.
2-4. PMQ positively influences PCQ.

H 3. The perceived qualities of e-Learning system components positively influence the performance of e-Learning systems.

3-1. PCQ positively influences the user's satisfaction with e-Learning systems.
3-2. PTQ positively influences the user's satisfaction with e-Learning systems.
3-3. PMQ positively influences the user's satisfaction with e-Learning systems.
3-4. POQ positively influences the user's satisfaction with e-Learning systems.

H 4. The learning subject and learning style moderate

the effects of perceived qualities of e-Learning system components.

4-1. The learning subjects moderate the effects of PCQ regarding user's satisfaction.
4-2. The learning subjects moderate the effects of PTQ regarding user's satisfaction.
4-3. The learning subjects moderate the effects of PMQ regarding user's satisfaction.
4-4. The learning subjects moderate the effects of POQ regarding user's satisfaction.
4-5. The learning style moderates the effects of PCQ regarding user's satisfaction.
4-6. The learning style moderates the effects of PTQ regarding user's satisfaction.
4-7. The learning style moderates the effects of PMQ regarding user's satisfaction.
4-8. The learning style moderates the effects of POQ regarding user's satisfaction.

IV. Research Methodology

IV .1 Definitions and Operationalization of Variables

Most measurement items were adopted from previous studies and modified to our research context. Two critical issues on the measurement of the consensus of stakeholders were the objects and the degree of consensus. As mentioned already, the objects of consensus are the influential factors for user satisfaction with e-Learning systems. As for the degree of consensus, we adopted the phenomenological approach that puts emphasis on the belief of organizational members regarding the degree of shareness of mental models among themselves and then calculated the Euclid distance among respondent's beliefs about this shareness of mental models.

It was quite challenging to choose the objective measure for the performance of e-Learning systems. User satisfaction and system use are especially popular because direct benefits and costs are associated with many delicate issues, such as time lag, control of exogenous factors, and representation. However, when information systems are in obligatory use due to regulatory or conventional reasons, user satisfaction is more appropriate than system use as the surrogate measure of information system success [2]. Therefore, we adopt user satisfaction because corporate e-Learning systems are compulsory in many organizations.

IV .2 Samples and Data Collection

We first contacted the top three e-Learning service companies in Korea and requested their client list. To avoid sampling bias, we selected companies in various industries and of diverse size. We asked our first contact person of the e-Learning service provider to introduce staffs who had worked for more than two years, and then surveyed the inductees. Then, we contacted the human resource department staff of this client company list, who was in charge of corporate education or e-Learning programs. We asked the first contact person to introduce more of the corporate education staffs who had been in the same job for more than two years, and then asked these staff persons to cooperate with our research by participating in our interviews, surveys, and introducing the e-Learning system users (learners). Finally, we contacted e-Learning system users who had taken more than two courses in their current organization. The consensus on each CSF was calculated by the Euclidean distance among the perceptions of the user, his/her organization's HR department, and his/her e-Learning service provider regarding the importance of the same e-Learning components. User perceptions on the qualities of these components and user satisfaction were the subsequent indigenous variables of this exogenous variable (i.e., consensus).

We distributed total 500 questionnaires to 3 e-Learning service providers and 18 client companies of these e-Learning service providers. In three weeks, 426 surveys were replied (return rate was 85.2%), and 398 surveys were judged appropriate for further statistical analysis excluding 28 invalid replies. There were 311 end-users (learners), 36 human resource department staffs, and 51 service provider staffs.

V. Data Analysis and Hypothesis Test

V .1 Qualities of Instruments: Reliability and Validity

Reliability of each first-order construct measurement was assessed by Cronbach's alpha. The Cronbach's alpha of 'system quality' in PTQ was 0.58 below the general criterion of 0.6. However, we decided not to exclude this construct because it is one of the major components in PTQ of our research model, and exhibited acceptable reliability scores in other studies.

To investigate whether the questionnaire items measured the constructs as they were supposed to, we tested the construct validity of four, second-order latent variables by examining convergent and discriminant validity. Our convergent validity analysis demonstrated that all the *t*-values of CFA loadings were significant except for system quality and interaction. However, these constructs were not excluded from further analysis because it was important to retain as many original items as possible to preserve the original research design and then compare the results with other studies that used the same scales. The discriminant validity of constructs was assessed by criteria similar to multi-trait/multi-method analysis. To assess discriminant validity, we compared the measures of Average Variance Extracted (AVE) with the correlation values in the corresponding rows and columns. Discriminant validity would be secured if the diagonals exceeded 0.5 and the off-diagonals in the corresponding rows and columns [6]. Discriminant validity was secured for all the second-order constructs.

V. 2 Analysis

V. 2. 1 Goodness-of-Fit Determined by Comparing with

Alternative Competing Models

We constructed two competing models, C1 and C2. When compared to our research model (C3), Model C1 excluded the hierarchical structure among e-Learning system components. Meanwhile, Model C2 admitted the hierarchical relationship among PCQ, PMQ, PTQ and POQ, but assumed that PMQ and PTQ take up only the mediating role between POQ and PCQ without direct influence on user satisfaction with corporate e-Learning systems.

We used RMSEA (Root-Mean Square Error of Approximation) and TLI (Tucker Lewis Index) as goodness-of-fit indexes. RMSEA evaluates the discrepancy between model and data per degree of freedom and simultaneously considers both errors and parsimony of a research model. TLI addresses the enhancement of a research model compared to the null model. RMSEA needed to be less than 0.05 for excellent fit and range between 0.05 and 0.08 for acceptable models [3].

The criterion for TLI used to be 0.9-0.95 [13]. Our model demonstrated 0.066 for RMSEA and 0.94 for TLI, both of which satisfied the acceptable criteria.

However, it is not fair to consider only the goodness-of-fit indexes of research between models without considering complexity (degree of freedom). Therefore, we calculated the trade-off between goodness-of-fit (chi-square value) and parsimony (degree of freedom) among the competing models and concluded that our research model (C3) maintains a better fit than the competing models. C2 was more complicated than C1, thus having less chi-square value ($\Delta \chi^2 = 253.082$) and less degree of freedom (Δ Degree of Freedom=2). This improvement was significant, so C2 and C3 were compared next. C3 had less chi-square value than C2 due to model complexity ($\Delta \chi^2 = 10.913$) with the loss of degree of freedom by 2. This improvement was also significant.

V. 2. 2 Hypothesis Test

Figure 1 presents the result of SEM (Structural Equation Modeling) analysis by AMOS 4.0. Because our model was judged to fit our data, we refer to this model and test our hypotheses.

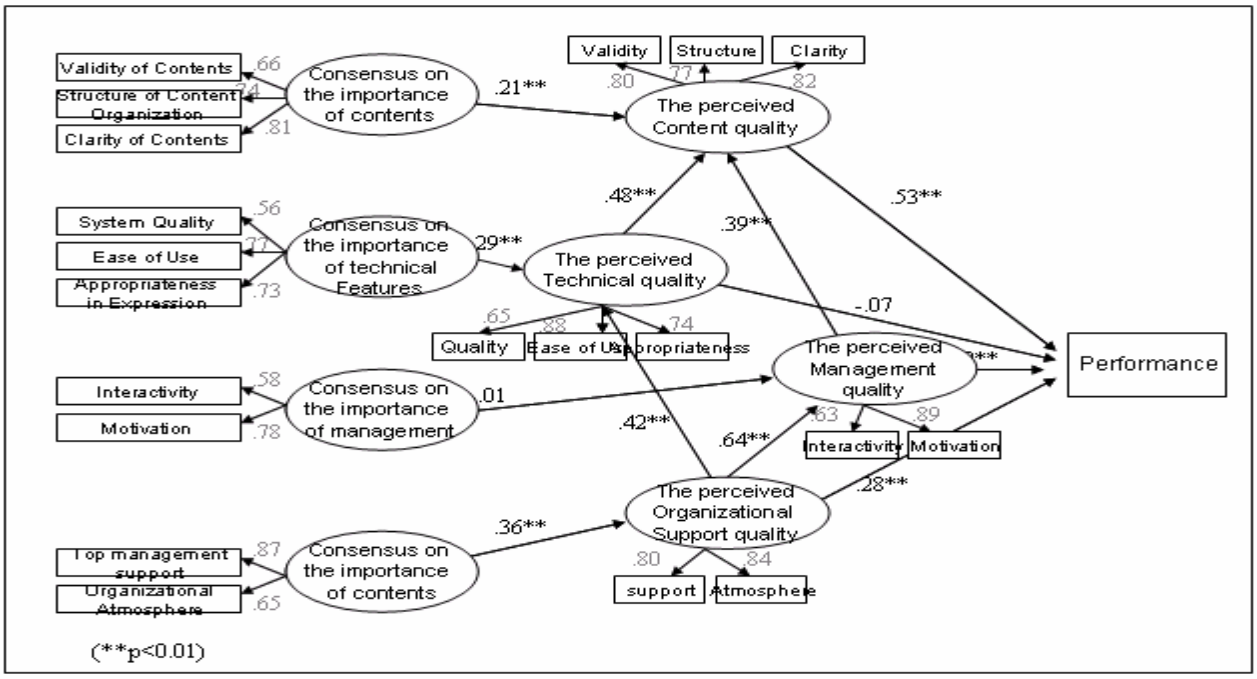
Hypothesis 1 stated that the consensus of stakeholders regarding the importance and value of critical success factors for corporate e-Learning systems positively influences the implementation quality of these factors. The analysis shows that all the path coefficients between stakeholder consensus and quality of critical success factors are significant except for the path to PMQ (Hypothesis 1.3).

Hypothesis 2 stated that the perceived qualities of e-Learning system components are in hierarchical relationships. Our analysis indicates that all the path coefficients are significant ($p<0.00$) as we assumed.

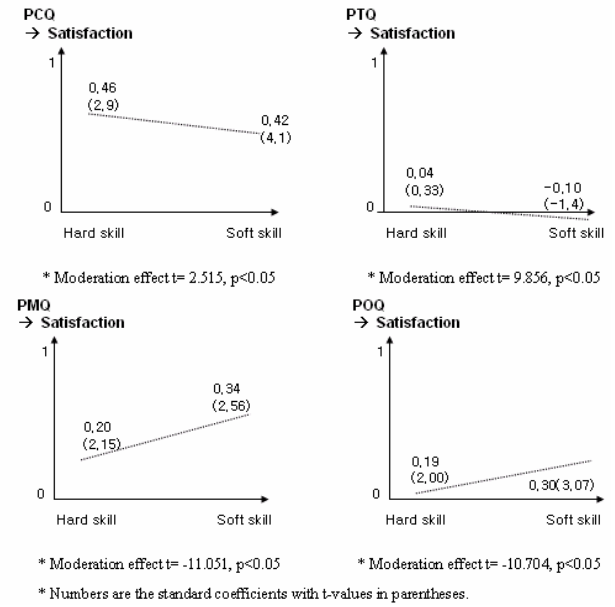
Hypothesis 3 stated that the perceived qualities of e-Learning system components positively influence the performance of e-Learning systems (user satisfaction). Our analysis shows that all the path coefficients between the perceived qualities of e-Learning system components and user satisfaction are significant except for the path from PTQ (Hypothesis 3.2).

Hypotheses 4.1 - 4.4 concern the moderating roles of learning subject between the perceived qualities of e-Learning system components and user satisfaction. Figure 2 demonstrates that the learning subject clearly moderates the effects of the perceived qualities of all the e-Learning system components on user satisfaction.

[Figure 1] Analysis Results

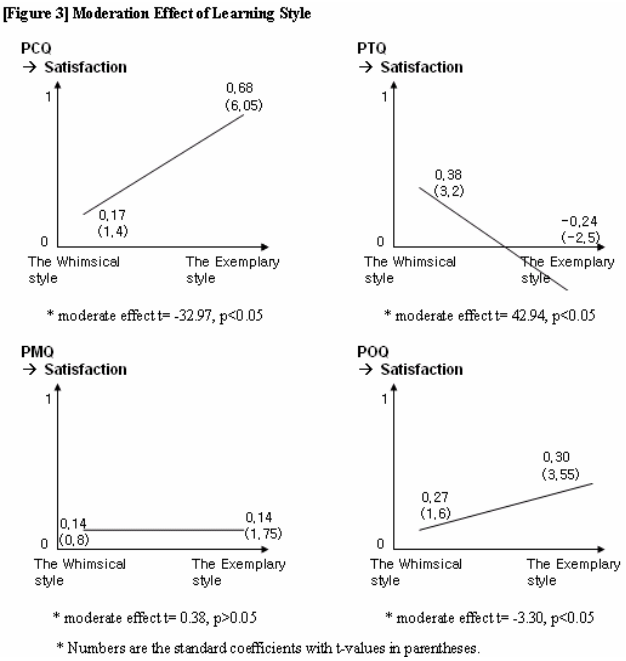


[Figure 2] Moderation Effect of Learning Subjects



Hypotheses 4.5 - 4.8 concern the moderating role of learning style between the perceived qualities of e-Learning system components and user satisfaction. Figure 3 illustrates that learning style significantly moderates the effects of perceived qualities of e-Learning system components on user satisfaction except for PMQ (Hypothesis 4.7).

[Figure 3] Moderation Effect of Learning Style



VI. Discussion and Conclusion

The primary purpose of this study was to recognize who has stakes for corporate e-Learning systems and how their consensus on the importance of e-Learning system components works on the implementation qualities of these components to eventually influence user satisfaction. In addition, we tested whether the influences of qualities of e-Learning system components change at different contexts, an issue that relates to when we can achieve the maximal value of e-Learning systems. Learning subject and learning style were found to significantly moderate the effects of critical success factors. Our findings can be summarized as follows.

First, stakeholder consensus on the importance of e-Learning system components helps implement most of these components in good quality except for management quality. In other words, stakeholder consensus on the importance of content, technical features, and organizational support for corporate e-Learning systems leads to the implementation of these three components in good quality, respectively. Even though many management services are embedded or cared for by automatic systems, we found that learner perception regarding the quality of e-Learning service provider management is substantially influenced by the personal characteristics (attitude, mission, personality, etc.) of staffs in charge of e-Learning rather than being facilitated by the consensus of related stakeholders. For example, in the case of examination or report submission, learners confessed that they are more thankful for personal calls, emails, or consultation with staff than mechanic or blunt notification from systems because they can talk about their personal problems or negotiate schedules.

Second, in regards to the hierarchical relationship among e-Learning system components, we found that organizational support quality buttresses the quality levels of all the other components. It influenced the qualities of technical features and management, both of which in turn facilitated the realization of content in good quality. Our finding that technical quality leads to content quality implies that learner perception regarding content quality can be improved if the e-Learning system uses more advanced technical features, such as multimedia functions. The influence of management on content quality signifies that the quality of content is not only related to text materials, but also to the interaction with instructors and operators. E-Learning service provider management and technical features are the instruments of the content to be delivered and internalized by learners. The value of such facilities is appreciated much more if user organizations (especially, human resource departments in charge of corporate education) demonstrate strong support for e-Learning programs. Therefore, our study reveals that organizations should establish and demonstrate a strong culture and intent for corporate e-Learning systems more than any other effort.

Third, all the components except for the technical quality, had a positive influence on user satisfaction with e-Learning systems. The reason for the lackluster influence of technical features could be traced to the more recent development of information technologies and a default embedment of such features into most e-Learning systems in Korea. In the past when there was substantial variance in IT features of e-

Learning systems, such features did matter for user satisfaction with e-Learning systems. Such phenomena have recently dissipated because IT features have become quite standardized among e-Learning systems in Korea, so that most e-Learning systems are not differentiated from each other in terms of technical features.

Fourth, we verified that the learning subject and learning style moderated the influences of these e-Learning system components regarding user satisfaction. Particularly, the learning style addressed the more dramatic moderating role. The whimsical style appreciated the qualities of content and organizational support, whereas the exemplary style did not. The exemplary style acknowledged the quality of technical features, while the whimsical style did not.

Our study has the following limitations that need to be overcome by future studies. It seems appropriate to include the role and influence of instructor as another stakeholder as long as the content can be regarded as the core component of e-Learning systems. In our study, the issues of instructor were submerged into content. Future studies can distinguish the issues of instructor from content and analyze the independent influences of instructors on user satisfaction.

MIS studies have been successful in identifying and verifying **what** are the critical success factors for implementation of various types of information systems. Our question was basically related to **how** we can implement these factors and attend to the consensus among stakeholders that facilitate the implementation of those factors. We wish more future studies to elucidate the processes and conditions regarding how we can implement those important factors better for successful information systems.

References

[1] Baldwin, T. T., and Ford, J. K. "Transfer of training: A review and directions for future research," *Personnel Psychology*, 1988, 41, 63-105.

[2] Barki, Henri, and Huf, S. L. "Change, attitude to change, and DSS Success," *Information & Management*, 1985, 9, 261-268.

[3] Browne, M.W., and Cudeck, R. Alternative ways of assessing model fit. In K.A. Bollen and J.S. Longs (Eds.), *Testing structural equation models.* Newbury Park:, Sage. 1993.

[4] Cannon-Bowers, J. A., and Salas, E. "Reflections on shared cognition," *Journal of Organizational Behavior*, ,2001, 22(2), 195-210.

[5] Chase, N. "Raise your training ROI," http://qualitymag.com, 1997.

[6] Chin, W.W. "Issues and opinion on structural equation modeling," *MIS Quarterly*, 1998, vii-xvi.

[7] Davis F. D. "Perceived usefulness, perceived ease of use and user acceptance of information technology," *MIS Quarterly*, 1989, 13, 319-339.

[8] Davis, S. and Bostrom, R.. "Training end-users: An experimental investigation of the roles of the computer interface and training methods," *MIS Quarterly*, 1993, 17(1), 323-332.

[9] Delone, W.H. and Mclean E.R. "Information systems success: The quest for the dependent variables," *Information Systems Research*, 1992, 60-95.

[10] Doll, William J. "Avenues for top management involvement in successful MIS development," *MIS Quarterly*, 1985, 15-35.

[11] Freeman, R. Strategic management-A stakeholder approach. Marshfield, 1984.

[12] Howell. J. J., and Silvey, L. O. Interactive multimedia training systems. *The ASTD Training and Development Handbook: A Guide to Human Resource Development*, 4th Ed., New York: McGraw-Hill, 1996, 534-563.

[13] Hu, L. and Bentler, P. M. "Cutoff criteria for fit indices in covariance structure analysis: Conventional versus new alternatives," *Structural Equation Modeling*, 1999, 6, 1-55.

[14] Inmon, W. H., Rudin, K., Buss, C. K., and Sousa, R. *Data Warehouse Performance*, John Wiley & Sons, Inc, New York, 1999.

[15] Keegan, D. *The Foundation of Distance Education*. London : Croom Helm, 1986.

[16] Keller, J. M. The motivational design of instruction, in C. N. Reigeluth (Ed.) *Instructional design theories and models: An overview of their current status*, Hillsdale, NJ: Lawrence Erlbaum Associates, 1984.

[17] Kirshner, D.and Whiteson, J. A. *Situated cognition: Social, semantic, and psychological perspectives.* LEA, NJ, 1997.

[18] Klimoski, Richard and Susan Mohammed . "Team mental model: Construct or metaphor? *Journal of Management*," (20:2), 1994, 20(2), 403-437.

[19] Noe, R. A. "Trainees' attributes and attitudes: Neglected influences on training effectiveness," *Academy of Management Review*, (11:4), 1996, 11(4), 736-749.

[20] Onisk, M. Is measuring soft-skill training really possible? http://go.elementk.com, 2003.

[21] Roschelle, J. "Learning by collaborating: Convergent conceptual change," *Journal of the Learning Science*, 1992, 2, 234-276.

[22] Rossi, P. H. and Freeman, H. E. *Evaluation: A systematic approach*. Beverly Hills, CA: Sage, 1985.

[23] Sharp, V. *Computer education for teachers*. Brown and Benchmark, 1996.

[24] Thomas, K. W. "Conflict and conflict management: Reflections and ipdate," *Journal of Organizational Behavior*, 1992, 13, 265-274.

[25] von Glaserfeld, E. "Cognition of knowledge and teaching," *Synthesis,* 1989, 80, 121-140.