Knowledge Management and E-learning for Organizational Culture

Omprakash K. Gupta* · Yuan-Duen Lee** · Yuan-Ching Wang** · Shih-Chun Tein***

Abstract

Knowledge management becomes the key point for organizations to survive and maintain competitive advantages in the knowledge economy era. E-learning plays a vital role for the organizational learning. How to share the experience of knowledge and the success of the knowledge management has great connection with the organizational culture. This study focuses on the factors of effective E-learning as well as its relation to the organizational culture. A successful e-learning system should not only aim at different statistical variables but emphasize on : course contents, variety of teaching methods and establishes a stable network environment. A stable E-learning platform and speedy bandwidth is a must to achieve the non-barrier communication and built an interactive learning environment.

To achieve success in E-learning, it is not necessary to divide the organizational culture to strengthen the course content multiplication and plans the E-learning supervisory work by the sole responsibility unit. It should establish an ample teaching frequency width and platform and also must establish the appropriate study network frequency width and hardware equipment to achieve the best E-learning effect. The interaction in different organizational culture in adapting E-learning, those Ad-hoc and Marketing Culture, are mostly influence by the external environment and have more interactive content. Those in Clan and Hierarchy Culture are affected by traditional conception and lack of interaction. Meanwhile, under the cost consideration, Clan and Ad-hoc Culture on the dynamic side prefer to spend more cost on E-Learning while the stable side, Hierarchy and Marketing culture are willing to pay more expenses on E-Learning.

Keywords : E-learning, Organizational Culture, Knowledge Management

1. Introduction

Even though, manufacturing industries employing a substantial proportion on research and, development and technology-oriented workers, the information technology industries exhibited particularly strong productivity of growth over the period of 1987~1999. Despite the trivia economy of dot com, E-learning became the new stem of IT with a rapid progress speed. According to the survey of 600 main companies in US by Bryan Chapman, an analyst of Brandon Hall, more than 60% of them are conducting different shape of electronic learning or training and gain a 49.4% growth rate compared to the prior year.

By means of revolution of internet technologies, an organization can remain at its sustainable competitive advantage using knowledge management. Not only technology and knowledge itself but organizational culture also is the necessary component of a successful gain and as a mean to transfer of knowledge to the business administration (Davenport and Prusak [8]). The research of Alavi [2] also shows a strong relationship between organizational culture, the experience of sharing knowledge, and the successful knowledge management. In other words, the success of knowledge management depends on the coordination of an organizational culture and the management. It proofs the important role of organizational culture as a result of knowledge management.

E-learning offers the utmost convenience and flexibility, aiming on organizational learning of business (Pamela [18]). According to the survey conducted by Directorate general of Budget Accounting and Statistics, executive Yuan, in 2001, the applications of information system among employees in Taiwan shows 1,130,018 man/class of total training amount, which contents 65.1% of internal training, 31.8% of external training and 3.1% by Internet. This survey includes government training institute, schools and private training institutes. It means most of the training remains on the traditional internal lecture courses and E-learning is an underdeveloped field which needs to be discovered.

There are different kinds of obstacle when promoting E-learning. More than one fourth (26.05%) of the institute faced obstacle caused by organizational culture when proceeding E-learning. The characteristic of organizational culture strongly affect the guidance of information system. This characteristic of information technology cannot match the original organizational culture unless the working process is modified in advance. If the organization lack of solid structure and system, the rapid inflow of information system will be more complex and conflict will arise.

When organization implement E-learning, it can reduce the gap between executives and employees. A discussion group can be formed online and break the traditional interdepartmental isolation that contribute to the limitation in organization. Such culture can generate new ideas and minimize the problem inside the organization. This kind of culture is part of the learning process in an organization.

The form of organizational learning needs an

organizational culture to stimulate the employees toward innovation improvement and urge them to face the changing environment. The organizational learning process needs a mindset and organizational structure that can urge different group from different domain in the organization to cooperate and interact in a mutual learning process. Opening and urging learning in organizational culture will lead to the success of E-learning.

The progress of knowledge management from 1990's in organizational culture and organizational structure which collect and implement data with Information Technology (IT) through collecting, organizing, saving, sharing, transferring and implementing information. These procedures help in innovating the organization, upgrading productivity and increasing assets of the organization continuously to face the challenge in this changing world. The viewpoint of a strong relationship between E-learning with organizational culture will lead to a further discussion in this study based on the earlier research.

2. Literature Review

2.1 Organizational Culture

More and more scholars agreed that organizational culture portrayed the evolution performance of the firm. Kotter and Hestett [14] invited 75 executives with financial backgrounds to evaluate 12 thriving firms and 10 under-performed firms. From the surveys, 74 executives found a relationship between organizational culture and the firms' performance while only one executive showed a different result.

The employees' individual influence in organizational culture has an impact on loyalty, sympathy, productive forces, physical condition, and emotional index, and so on. A number of scholars' research holds firmly the view of organizational culture and employee's organization commitment and productivity has a big relation.

If the regulatory authority approves a change in individual cultural then it will be successful. Otherwise the organizational culture transformation will flow into a fissure even more when the implementation encounter a tenacious resistance (Kozlowski, Chao, Smith, and Hedlund [15]).

Facing fast vicissitude society and technical development, organizational culture must simultaneously be in the same level. Is there any one objective of scientific method that discusses the organizational culture and its diagnosis tool? If some people pat their chest to guarantee the marketing way is the perfect organization overhead constructions and the best leadership series imperial way guarantee to make money; therefore, the programmer should design a formula which guarantee a prize winning ticket to be equally practical. Some people discuss the organization from a different construction factor to change the quantification of diagnosis feasibility. Undoubtedly, originally it has genitals to snort contemptuously (Fitzgerald [12]).

Cameron [7] develops a set of special characteristic of leader series imperially from organizing to control, managing employees, organ-

ization fitting (glue), strategy center of gravity and success definition, etc. There are six big construction factors by which organizational culture can be diagnosed. The transformation tool and statistical analysis of the types of organizational culture which will systematize the culture into a stable and elastic degree are divided into Clan, Hierarchy, Market and Adhocracy.

Annotations of the quantity obtained from the six big constructions factors depict different graphs and induces organizational culture in different industrial form. As an organization transforms, simultaneously it carries on the basis of organizational culture transformation. This set of diagnoses tools was called Organizational Culture Assessment Instrument (OCAI), developed 20 years ago. The tool was successful on hundreds of industries in introducing organization transformation time, plan organizational culture transformation and the appraisal tool.

There are different comments on the relative quantity of the result of OCAI in different forms of organizational culture chart. It puts a great emphasis on which culture does not have the wrong culture. Mostly, organizational culture concurrently has four kind of cultures combination of many degrees.

2.2 Interactive Concept of E-learning

E-learning, by no means, joins the computer network in the traditional education related essential factor. In a perfect E-learning environment, it should contain multiplex learning ac-

tivity; therefore, the learning can obtain the integrity of the study process. However, according to Wu's study in 2000, the long-range teaching system must not only be able to integrate the present study material, but also in the study process it must provides the study material introspection of opportunity. Nevertheless, it can be achieved with the interaction of mentor to change it into true knowledge. The teacher penetrates networks to be globalized and the teaching material content correlated to the study resources organized has the system of conformity simultaneously. The design can be customized accordingly. Internet search and frequently asked questions will provide exploration and collection of material origin. The E-learning also provides a customized working area to study, to observe and emulate with the revolutionized opportunity. Individual study collections are also permissible to be shared with registered individual email accounts and home pages.

Education and training human resources can be divided into : training, development and education in service. Training includes employees' training and specific technical ability as the principle. Development takes the future growth as the goal; emphatically theory and knowledge guidance raises employees' power and the self-growth ability is the goal. Therefore, training does not equate to "development education." Technical training promotes the skill which the existing work needs primarily; the development of education then trains the employees to hold the post of the skill, or the solution questions ability which needs a higher

step. On two executions surface analysis, training deviation concrete study, belongs to the short-term of the memory study and the promotion line; the development education favors long-term ambush's study and development.

The E-learning convey users in organizing human resources in education and training. On the application side, it is divided into the general skill training and the development education.

- Skill training-use E-learning in specialized technical training, focused on short-term skill training and computer skill, formula design and sales-clerk training.

- The development education-organization uses the network science and technology and carries on the long-term development education. This kind of development education involves theory and specialized knowledge training, the organization interior training manpower, the physical resource, the financial resource that are unable to coordinate in usual meeting and organization specialist training, development facility or school cooperation carries on the long term education.

2.3 Organization to E-learning Cognition

E-learning using network multimedia indefinite tense characteristic educates greatly in teaching compared with the traditional classroom fixed point and time. Therefore, all the teaching material design, the teaching support system and the study resources depends on the overall teaching system conformity and support. The study effect by the way of teaching and

the transfer method are extremely important (Willis, [25]). Aberekston [1] argued, the success of E-learning highly connected with simplicity of operation, interaction, supporting feedback function, increasing application ability, multimedia application, cost consideration, supplementary teaching material, quality of database, security and privacy. Sufficiently, all of them will affect the decision maker in education process or training tools.

E-learning function demand such as the Computer Assistance teaching (CAI), the Computer Management teaching (CMI), the Computer Medium Communication (CMC) and the Computer Multimedia (CBM) performs the conformity to become the overhead construction under WWW integrity and the software. Therefore, the E-learning system must have stated the teaching mechanism software, the management training mechanism, the medium communication mechanism and the multimedia conformity mechanism. This research evaluated the E-learning system focusing on the nine major E-learning functions, respectively :

- Provides the appraisal and the curriculum design and the development function

- Provides the high quality curriculum content

- Provide the use which the content widespread also is easy to operate to lie between the surface

- Penetration advanced technology or the study way to provide the best learning experience

- Penetrates each kind of mechanism regular strengthening study

- To provide the mechanism assistance shape to form on-line
- To coordinate the study group centralization tracing and the management
- Has the elasticity or the standardization
- Provides consultation, the execution and the conformity

3. Research Methods

The first part examines the organizational culture diagnosis and analysis of organizational cultural attribute. This is to understand the acceptance of E-learning in present situation by questionnaire survey focusing on the usage, perception and current situation.

The second part will depend on the literature discussion obtained on reorganization. The induction is according to the three constructions factors, correspondingly; E-learning environment cognition, organizational culture special characteristic and E-learning in decision-making.

The final part analyzed the users understanding in various factors based on the degree of importance with the industrial environment.

3.1 Hypothesis

Network advancement in technology is amazingly quick. Whichever knowledge management is for the organizations to survive or to maintain the key competitive advantage, must successfully grasp the shift of knowledge. Besides technology and knowledge, organizational culture is also the indispensable essential factor (Davenport and Prusak, [8]). Alavi [2] findings showed the organization success, sharing knowledge and experience and the knowledge management related with the organizational culture. Organizational culture has a tremendous influence on information system inducted. The original culture in the organization can coordinate only if there is a sedulous change in the system design process. If there is a lack in organization's system and everything is lackadaisical, then the information system inducts possibly can create a very big conflict.

The literature review supports the idea of organizational culture and E-learning relationship, therefore, under a fair research overhead construction, this research proposes that;

H1 : The industry environment can affect the E-learning decision-making

Among the characteristics of the industrial environment, the degree of the circulation of IT has significant correlation with E-Learning. Organizations adapting E-learning as the training tools have a higher circulation degree of IT. Nevertheless, the industrial life cycle, degree of focused, rival of competitive and the promotion of government seem to have less correlation with adapting of E-learning.

H2 : The organizational culture can affect the E-learning decision-making

Organization that adopt E-learning can break the isolation between the department unit's responsibility and the subordinate. Individual or team group can naturally foster the custom on their own initiative in networking which discusses with other people, aiming on problems that are necessary to be solved and provide conception and confidentiality. The organizational culture is only a study organization essential item; therefore the organization also needs to have a mental blueprint (Mind-Set) and the organizational structure, to positively encourage various domains specialty in a group.

H3 : The E-learning environment cognition can affect the E-learning decision-making

The E-learning by no means is similar to the computer network in traditional education that relates to an essential factor; it should contain a multiplex learning activity to obtain the integrity in the study process. The study then can possibly change into its true knowledge. Therefore, this research by network factor, teaching material content, teaching software, network environment, interaction effect and cost consideration evaluates the organization using E-learning in the decision-making process.

H4 : Organizational culture and E-learning environment cognition related

The firms utilize information technology to coordinate the organizational culture and organizational structure to collect, gather, store, transform, sharing and utilize the process into organization's knowledge. It promotes the organization innovation and regeneration through the above process. It also enhances the organization productive forces, increases the organization assets, and takes advantage of the enhancement of the organization in accordance to the external changes in environment and unceasingly self-remolding power.

According to past study, the small and medium size firms seldom use e-learning as their training tools. This research can only focus on those firms with e-learning experience. The research used the information gathered from the questionnaire and compared with the literature discussion using experts' opinion to revise. Through a thorough investigation and measure, any insufficiency will be adjusted according.

4. Results

The respondents for the survey were 205 organizations that adopt E-learning in their organizations. However, only 186 surveys were valid for analysis. After analyzing the data collected using SPSS statistical software the following result were found :

4.1 Reliability Analysis :

Based on the E-learning environment cognition, the a value of the teaching material part is 0.8921, 0.9205 for software content, 0.9205 for network environment, 0.9118 for interaction effect, 0.8763 for cost consideration and 0.9429 for function of characteristic the net-

work. The consistency factor of interior achieved certainly reveals the standard and reaches the sub-item regularly used, portrayed out an extremely good result.

(1) Descriptive Statistical Analysis

Analysis of the organizational culture by Cameron's [7] OCAI tools, categorize organizations implemented E-learning into 4 dimensions; clan cultures(48), Ad-Hoc culture(36), Marketing culture(48) and Bureaucrat culture(54). Subsequently the ratio are 36% in education industry, 25.3% in service industry and other industries such as information industry, construct industry, wholesaling industry and government unit which the ratio are lower.

The size of trainee adapting E-learning comparatively do not reveal much difference. The population implements E-learning in 100-200 and 500 person of the above industry are said to be ideal. Organization implemented E-learning and actually participate in E-learning still at the basic stage and need to be strengthen. Employees adopting E-learning classified by gender is dominated by female by 71.5%. Mostly who adopting E-learning are university degree employees about 72.6% and if added those who have a master degree the accumulated percentage are about 96.7%.

(2) ANOVA Analysis

There are various variable contributed to organizational cultures. Therefore, there is a need to carry out ANOVA analysis. The analysis results are shown as follows :
  • Teaching material contents : Different or-

ganizational culture demand whether it is highly connected and can shift the organization solid service usage has difference aspects. Nevertheless, the content whether multiplication ($p = 0.124$) and easy management planning ($p = 0.064$) does not have much difference.
  • Network environment : The difference between organization and the stability of teaching platform as well as the bandwidth of network are significant. The differences between network bandwidth, hardware with fitness of e-learning are non-significant. Therefore, different organizational culture can have a different demand on teaching platform establishment and network bandwidth.
  • Software system : The factors of interaction effect and cost consideration of the software system are different in each organizational culture.
  • Industry : Teaching communication, network bandwidth has no difference with the industries. However, the other variables of the factor can reveal the difference. Training related links or sharing resources in projects, the different effects are limited.
  • Size of employees : There are significant differences in various factors. It comes from the communication effect, stability of teaching platform and the fitness of network bandwidth while limited significance on training linkage, resource sharing and the cost consideration in maintenance cost are not significant.
  • Position of trainee : The position in a firm

has significance with most of the variable while the diversification of contents of teaching material, communication between trainer and trainee, evaluation system of software and the abundant of teaching method have limited significant.

- Gender of the trainee has significant variance with most of the variable while the communication between trainer and trainee, establishment cost of the network are less variance significance with gender of the trainee.

- Service year of the trainee : The service year of the trainee has significant variance with most of the variable but the support of Multimedia Aid system.

The variable within the e-learning environment cognition factors showed significant correlations. On the contrast, the organizational culture shows less correlations with other factors but showed significant correlation ($p < 0.001$) to the interactive factor cost consideration part ($p < 0.05$).

(3) Regression Analysis

Then will discussing the regression analysis of curriculum content, software system, network environment, interactive effect and cost consideration to the overall network teaching function influence. By multiple regression analysis result, the network environment in the overall environment teaching appraised does not have significance. Its regression equation is as follows :

Function = 0.629 + 0.719 Soft + 0.222 Cost + 0.120 Cont − 0.264 Int

Function : Overall E-learning function
Soft : Software system
Cost : Cost consideration
Cont : Course contents
Int : Interactive effects

This regression equation may explain the variation measures of R square to reach 0.859 and its D-W value 1.767. It is in a reasonable scope. Therefore, the variation quantity is quite high as the model of each forecast variable connected, the usability is quite high.

5. Conclusion

Usage of E-learning in decision making differentiate from one industry to another based on the statistical variable. Different profession and different factors such as the curriculum content, software system, network environment, interaction effect and cost consideration, has different policy-making plan. In network equipment, the teaching network bandwidth is the base requirement for all industries.

In interaction effect, the training related links or the sharing resources on project are commonly implemented to decision-making when adopting e-learning. Service years of trainee show variation on all factors. Whether it is senior or junior trainee, all preferred the multimedia aid e-learning system. It means no matter what the organization life cycle, the uses of multimedia aid software have to be engaged in the E-learning system.

Size of trainee shows variation while the communication between trainer and trainee, stability of e-learning platform and plenty network bandwidth among the software factor are identified important to all size of trainee. Meanwhile, linkage to the train related fields and resource sharing and maintenance cost from interactive factor are required by all size of trainee also.

The position of the trainee shows variation with all factors while the variety of teaching material as well as the communication application and online evaluation system are prevailed without any difference on the position of the trainee. The communication among software factor and installation cost shows less variation when applied to the gender of the trainee

In summary, a successful of e-learning system should not only aim at different statistical variables but emphasize on : course contents, variety of teaching methods and establishes a stable network environment. A stable E-learning platform and speedy bandwidth is a must to achieve the non-barrier communication and built an interactive learning environment.

Different software system in organizational culture contributed to the different factors in interaction effect and cost consideration. Nevertheless, the course content multiplication (p = 0.124) and easy management planning (p = 0.064) does not have much different in the study network frequency width and hardware equipment Therefore, from organizational culture viewpoint to achieve successfulness in E-learning, it is not necessary to divide the organizational culture to strengthen the course content

multiplication and plans the E-learning supervisory work by the sole responsibility unit. It should establish an ample teaching frequency width and platform and also must establish the appropriate study network frequency width and hardware equipment to achieve the best E-learning effect.

In E-learning environment cognition construction factors seem to be highly connected with interaction. The interaction in different organizational culture in adapting E-learning, those Ad-hoc and Marketing Culture, are mostly influence by the external environment and have more interactive content. Those in Clan and Hierarchy Culture are affected by traditional conception and lack of interaction. Meanwhile, under the cost consideration, Clan and Ad-hoc Culture on the dynamic side prefer to spend more cost on E-Learning while the stable side, Hierarchy and Marketing culture are willing to pay more expenses on E-Learning.

The regression analysis on curriculum content, software system, network environment, interaction effect and cost consideration in overall E-learning function have a great influence. The E-learning curriculum on software system has a high interaction, the back coupling function, on-line comments on E-learning achievements and the teaching method can lead to a formation of study group must emphasized on the uses the multimedia teaching. The next vital thing is the cost consideration.

References

[1] Abrektson, J. R., Mentored online seminar :

A model for graduate-level distance learning, *Technological/Horizons in Education*, Vol. 23, No. 1, 1986, pp. 102-105.

[2] Alavi, M., and Leidner. D. E., Knowledge management system : issues, challenges, and benefits. *Communications of the AIS*, Vol. 1, No. 7, 1999, pp. 1-37.

[3] Biggerstaff, C. A., Creating, managing and transforming organizational culture in the community college : Perspectives of reputationally effective presidents. *Dissertation Abstracts International*, 51(06), 1882A. (University Microfilms No. AAC9031514), 1990.

[4] Brown, J. S., Collins, A., and Duguid, P., Situated Cognition and the Culture of Learning, 1989.

[5] Buch, Kimberly and Wetzel, David K., Analyzing and realigning organizational culture. *Leadership and Organization Development Journal*, Vol. 22, No. 1, 2001, pp. 40-44.

[6] Caldwell, Bruce, Missteps, miscues. *Information Week*, 1994.

[7] Cameron, Kim S., Techniques for making organizations effective : Some popular approaches. *Enhancing Organizational Performance*. Washington D. C. : National Academy Press, 1997.

[8] Davenport, T., and Prusak. L., Working Knowledge : How Organizations Manage What They Know. *Harvard Business School Press*, 1998.

[9] Deal, Terrence E. and Kennedy, A. A., *Corporate Cultures : The rights and rituals of Corporate Life*. Reading, MA :

Addison-Wesley, 1982.

[10] Doust, Richard, Downsizing : Making it work, *CA Magazine*, 1998.

[11] Ernst, R. C., Corporate cultures and effective planning : An introduction to the organizational culture grid. *Personnel Administrator*, No. 30, 1985, pp. 49-60.

[12] Fitzgerald, Thomas, Can change in organizational culture really be managed? *Organizational Dynamics*, No. 17, 1988, p. 4.

[13] Hiltz, S. R., The virtual classroom : Learning without limits via computer networks. Norwood, NJ : Ablex, 1994.

[14] Kotter, John P., and Heskett, James L., *Corporate Culture and Performance*. New York : Free Press, 1992.

[15] Kozlowski, Steve W. J., Chao, Georgia T., Smith, Eleanor M., and Hedlund, Jennifer, Organizational downsizing : Strategies, interventions, and research implications. *International Review of Industrial and Organizational Psychology*, No. 8, 1993, pp. 263-332.

[16] Moorhead, G., and Griffin, R. W., Organizational Culture. In *Organizational behavior* (2nd ed.), Boston : Houghton Mifflin, 1989, pp. 491-521.

[17] Ouchi, William G., and Johnson, J., Types of organizational control and their relationship to emotional well-being. *Administrative Science Quarterly*, No. 23, 1978, pp. 293-317.

[18] Northrup, Pamela T., Online Learners' Preferences for Interaction. *The Quarterly Review of Distance Education*, Vol. 2, No. 2, 2002, pp. 19-226.

[19] Pfeffer, Jeffrey, Producing sustainable com-

petitive advantage through the effective management of people. *Academy of Management Executive*, No. 9, 1995, pp. 55-72.

[20] Doust, Richard, Downsizing : Making it work. *CA Magazine*, 1998, pp. 16-20.

[21] Shaw, J. J., A comparison of elementary and high school organizational cultures. *Dissertation Abstracts International*, Vol. 52, No. 3, 1990, 770A. (University Microfilms No. AAC 9108744).

[22] Smircich, L., Concepts of culture and organizational analysis. *Administrative Science Quarterly*, No. 28, 1983, pp. 339-358.

[23] Trice, Harrison and Bayer, Janice, *The culture of work organizations*. Englewood Cliffs, NJ : Prentice Hall, 1993.

[24] Tromperaars, Fons, *Riding the waves of culture : Understanding diversity in global business*. New York : Irwin, 1992.

[25] Willis, Instructional design and situated learning, *Educational Technology*, Vol. 33, No. 3, 1993, pp. 16-21.

■ Author Profile

Omprakash K. Gupta

Omprakash K. Gupta is a faculty of Management in the College of Business, University of Houston-Downtown, Houston, USA. He has previously worked at Indiana University Northwest, Purdue University, IIM Ahmedabad and Nirma Institute of Management, and Prairie View A&M University, USA. He is the founder editor of two journals: International Journal of Operations and Quantitative Management, and AIMS International Journal of Management. His research interests are in operations management, supply chain management and information management. He received PhD in Industrial Engineering from the Purdue University.