A Conceptual Model for Measuring the Quality of e-learning through Knowledge Sharing Indicators

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Abstract - *The eras in which learning was limited to a special class of people has far reached its end. Rapid changes of information technologies, which affect all aspects of today's life, make continuous learning an inevitable requirement of prosperity and development. Nowadays, knowledge sharing plays a significant role in the process of learning, while both can be measured by their indicator factors. In other words, e-learning is a major state-of-the-art process of knowledge sharing in which, people intentionally attempt to share what they have learnt and receive the latest knowledge from the trainer of the e-learning process. This paper provides the scholars with an idea of finding and utilizing influential knowledge sharing measurement factors for e-Learning assessment which can provide an informative basis for further studies on quality measurement of e-learning processes.*

Keywords: e-Learning, Indicators, Knowledge Sharing, Measurement factors.

1 Introduction

In today's technological ever-growing environment, organizations need to keep their related field of knowledge up to date. Even, when an imagined organization pay for acquiring a specified field of knowledge, the people whom their tasks are dealing with the mentioned knowledge, should be trained to know how to use it. In such environments, learning should be seen as a continuous process, not as an isolated event. Among the various learning methods, from fully traditional processes of learning to fully electronic ones, the methods which approach the learning process in a fully electronic format tend to have potentials to be well-adopted and well-adjusted with the knowledge-based requirements of contemporary organizations.

E-learning generally refers to methods of learning which use electronic instructional content delivered via the Internet and is a term which is synonymous with Web-based or online learning [5]. Many researchers have written many papers on the e-learning topic and many advantages have been introduced about it. The table 1 reviews the advantages of e-learning provided by Roffe (2002), Wang (2003), and Zhang et al. (2004):

Table 1: Advantages of e-Learning

Advantages of e-Learning	Roffe (2002)	Wang (2003)	Zhang et al. (2004)
Cost-effectiveness;	●	●	●
Learner-centered;	●	●	●
Personalization;	●	●	
Time and location flexibility;		●	●
Fostering Self-paced learning;		●	●
Interactivity;	●	●	
Uniformity of content;	●	●	
Archival capability for knowledge reuse and sharing.		●	●
Just-in time;	●		
Accessible from any site with the right equipment;	●		
Contemporary;	●		
Scalable structure;	●		

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Continue of Table 1:

Advantages of e-Learning	Roffe (2002)	Wang (2003)	Zhang et al. (2004)
Content updated rapidly;	●		
Measurement of program performance.	●		
Encourages students to take responsibility.		●	
Stimulates understanding and the recall of information;		●	
Accommodates different learning styles and fosters learning through a variety of activities;		●	
Encourages browsing information through hyperlinks to sites on the World Wide Web;		●	
Provides context sensitive help;		●	
Develops knowledge of the Internet;		●	
Permits instructors to develop materials using the world-wide resources of the Web;		●	
Allows instructors to communicate information in a more engaging fashion;		●	
Potentially available to global audience;			●
Unlimited access to knowledge;			●

(*Sources:* [3], [4], and [8])

According to Longworth and Davies (1996), "In this age of globalization, knowledge acquisition has become the critical means for gaining competitive advantage, and as such learning has become a crucial element of knowledge acquisition, application and creation" [13]. Training the members of an organization in an effective and efficient manner improves their ability to cope with challenges which new technology brings with it. In this case, these people (e.g., university students) are the main non physical property of an organization, or in other words, potential human capitals of the mentioned institute. The process of training and keeping them up-to-date consumes a large portion of monetary and none monetary resources of any organization. If any person intends to leave the organization (e.g., university), in the most of cases, there is no major mechanism to keep or capture the developed capabilities and knowledge inside the organizational structure. Missing a knowledgeable professor, an instructor, or a student means creating a gap between the resource usage rate and the given outcome; in simple words, it means loosing an important part of organizational resources and available capability to manage the intensity of rivalry.

What concept(s) can assist universities in relieving the negative side-effects of such problems? In our opinion, knowledge sharing is one of the key answers to this question. Knowledge sharing comprises a set of shared understandings related to providing employees with access to relevant information and building and using knowledge networks within organizations [6]. One of the main methods of developing and utilizing invaluable knowledge, created during time in an organization which can be kept and even be developed, is through the processes of established knowledge sharing. Knowledge sharing processes can be conceived as the processes through which employees mutually exchange knowledge and jointly create new knowledge [2].

Imagine an educational world without any knowledge sharing mechanisms. No knowledge gathering and no development happens. Rationally, to learn something new, we shouldn't go through all of the past try and error experiences. Here is the point: Knowledge sharing affects learning and qualitative learning takes place through the sharing of knowledge. There are measurement indicators which can affect the e-learning quality through the measurement of knowledge sharing (K.S.) that takes place in this process.

2 Integrative View

Considering the effect of knowledge sharing on e-learning, we deeply investigated the indicators of knowledge sharing which can be directly utilized in the process of e-learning assessment. There are tree major categories, including Individual, Organizational, and Technical factors within which useful indicators lie. Our model focuses on the indicators of e-Learning and the effect of knowledge sharing (K.S.) process on e-learning while considering the knowledge sharing indicators which directly affect the e-learning process. Figure 1 (Next Page) presents the overall model.

By deeply exploring through credible international papers in the fields of education, knowledge-based training, knowledge sharing, e-learning and related concepts, we have reached to a set of working indicators with which, the quality of e-learning can be comprehensively assessed. The process of selection and extraction is based on the most cited indicators in a wide range of journals that have presented different practical and academic viewpoints on the e-learning

concepts and experiences. A significant number of papers made a categorization for such indicators which are disperse

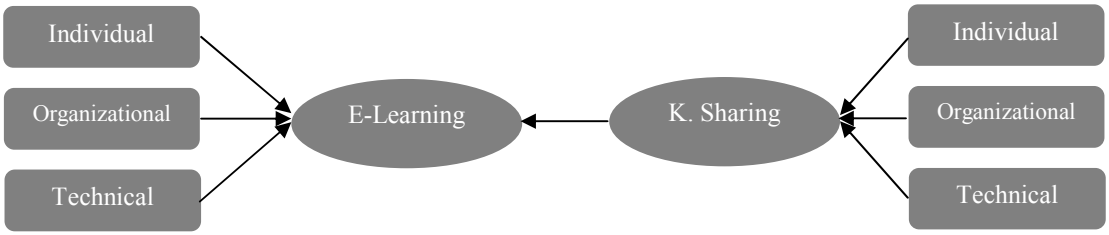

Figure 1: Knowledge-based e-learning measurement model

and separated which makes the qualitative measurement difficult to attain. Most of the common categorizations provide the community of practitioners with three major categories of *Individual*, *Organizational*, and *Technical indicators*.

In this deep and pervasive exploration of papers, the presented model has been broken down into the most validated indicators of knowledge sharing which are directly related with the e-learning major three indicators of success. The tables 2 and 3 summarize the findings on the most cited indicators which have participated in the papers of both sides that are related to the mentioned topics and are directly related together with an orientation towards e-learning:

Table 2: Related Indicators of quality measurement of e-Learning with respect to knowledge sharing.

Individual	***Organizational***	***Technical***
• Perceived Usefulness • Enjoyment (Learner / Instructor) • Learner's Computer Anxiety • Learner Attitudes toward Learning Management System (LMS) • Self Efficiency • Perceived Ease of Use • Interaction with other students and teacher • Encouraging interaction between students • Easy to Use • Perceived Content Quality ("content richness", and "update regularity") • (Perceived) Computer self-efficacy • Informativeness (= providing useful information by instructor) • Instructors' Control over Technology • Instructors' Communication Ability • Learner's study habits	• Ethical & Legal Issues (Ethical Roadmap) • Computer Usage (Low computer literacy level) • (Supportive) Organizational Culture • Infrastructures (Reliable and Up-to-Date Technological Resources and Infrastructures) • Trends (Social - Political)	• Maintenance (Efficient Technical Support and Maintenance) • Curriculum Management • Personalized Learning Environments (PLEs) • Interactive Content • Knowledgeable technology usage • Subjective Norms • Security (Robust Security Systems) • Reliability • Usability • User-Friendliness • Interactivity • Course Flexibility • Tutorial Quality • Clarity (clearly written) • Up-to-Dateness • Well Organized • Student Tracking • Maintenance • Cost

Table 3: Related Indicators of Knowledge sharing for quality measurement of e-Learning.

Individual	***Organizational***	***Technical***
• Differences in national culture or ethnic background. • Apprehension of fear (e.g. Fear about job security or losing superiority) • Lack of social network • Lack of trust in people • Lack of time • Poor communication • Taking ownership of intellectual property • Dominance in sharing explicit over tacit knowledge • Differences in experience levels • Age differences • Gender differences • Deficiency of formal and informal spaces (Colleagues' cooperation and participation) • Managers' tolerance towards employees making mistakes and learning from them • Lack of contact time and interaction • Differences in Education levels	• Existing corporate culture • Company support • Shortage of appropriate infrastructure • Restriction of physical work environment • Lack of a transparent rewards and recognition systems • (Deficiency of) company resources • (Lack of) top management support	• Lack of compatibility between diverse IT systems and processes

(*Indicators deriven from:* [1], [7], [9], [10], [11], [12], and [13])

The figure 2 illustrates the process of practical assessment of the model in educational establishments.

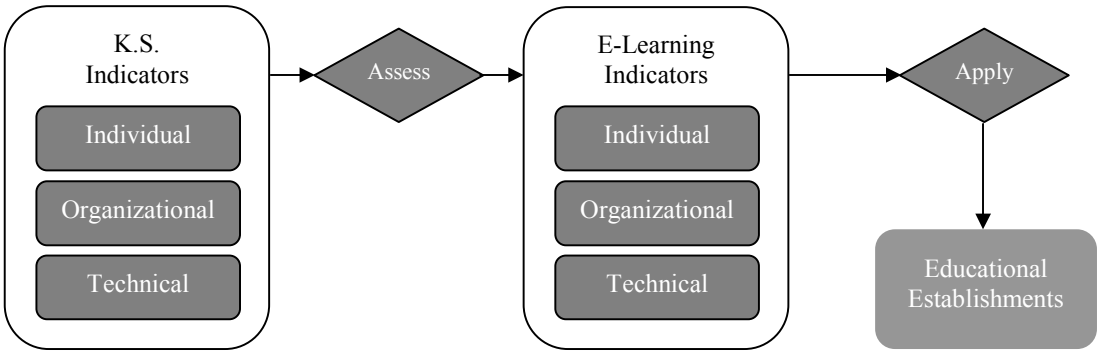

Figure 2: e-Learning performance measurement through Knowledge sharing indicators at educational establishments.

3 Conclusions

The model presented in this paper, covers the author's findings on influential knowledge sharing measurement factors that relate this interesting and practical field of study with e-Learning assessment methods. The model provides the scholars and practitioners with a practical set of approved indicators for assessing the knowledge sharing capability

within the e-learning process and since, the e-learning process is a major representation of knowledge sharing event, they are tightly inter-related and should come together while assessing quality of learning on an electronic basis. This becomes of significance when we consider the importance of information technology in the learning processes and also in the literature of knowledge sharing. The next major attempt might concentrate on the measurement and comparison of qualitative universities and ranking them in terms of their quality and quantity of e-learning within and outside the university boundaries. All of the educational establishments might fall within the model provided. The final suggestion is the expansion and further updates that are to be made periodically with an orientation toward the strategic concerns of educational establishments to remain competent in the competitive market of creating and distributing knowledge.

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How to reference:

Iman Raeesi, Davood Qorbani, Babak Akhgar (2010), "A conceptual model for measuring the quality of e-learning through knowledge sharing indicators", Proceedings of the 2010 International Conference on Information Knowledge Engineering, IKE 2010, July 12-15, Las Vegas Nevada, USA 2010, P 383-387.