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APPLYING SECI MODEL TO ENCOURAGE KNOWLEDGE CREATION IN ELEARNING ENVIRONMENT

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Abstract: *In recent years, advancing computing and network technologies have given new hope to increasing access to quality education. It has been noted in the literature that eLearning environment has a significant impact on knowledge-based activities. ELearning tools support collaboration among students with different competencies and capabilities, e learning facilitate knowledge access, sharing and dissemination.*

The goal of this article is to study the capacity of eLearning environments to encourage processes and created conditions consistent with Nonaka's model of knowledge creation (SECI).

The results show that there are a significant and positive relationship between the eLearning environment and SECI model. ELearning environment required students to share, construct and utilize knowledge through socialization, externalization, combination, and internalization.

Keywords: *Knowledge, eLearning, Knowledge Creation (SECI Model).*

1. INTRODUCTION

As the number of internet users is growing; the educational institutions and all businesses at all levels is moving rapidly to exploit internet technologies for instructional purpose (Mohammadi, 2015), reports and surveys show significant growth in online course offerings by higher education institutions (Tomei, 2009) and (Pantazis, 2002).

Future research will focus on the possibility of integration between knowledge management and eLearning (Hammami, Kassem, & Alhousary, 2015), in order to take

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advantage from the use of eLearning materials and activities in the process of knowledge handling and exchange in organizations and institutions that lead to provide organizational success and prosperity (Howell, 2010).

This study aims to present that there is integration between eLearning and knowledge creation process, in eLearning environment learners need to go through the processes of knowledge collaboration, exchange, sharing, acquisition, creation, distribution, dissemination, storage and personalization in order to acquire knowledge.

The paper describes the theoretical context of knowledge, knowledge creation processes and model, eLearning forms, and the relation between eLearning and knowledge management, A research model was introduced and hypothesis were form to be analyzed from distributing questionnaires between students of Syrian virtual university (SVU).

The paper presents and describes how eLearning environment encourage processes and created conditions consistent with Nonaka's model.

2. LITERATURE REVIEW

2.1. Knowledge

(Davenport & Prusak, 1998) and (White, 2001) Declared the concept of knowledge as follows: a mix of practices, values, contextual information, and expert that provides a framework for evaluating and incorporating new experiences and information.

Knowledge is difficult to hold and weak thing that is hard to define or classify (Spiegler, 2000). (Polanyi, 2012) Defined knowledge as a power to act and to make value-producing decisions that adds value to the enterprise and is held to be true in a given context to drive people to make an action.

According to (Nonaka & Nishiguchi, 2001) there are two types of knowledge: explicit knowledge and tacit knowledge. They defined explicit knowledge as the knowledge that is taught in class rooms and available through books, it is easy to communicate and hence share, so for this reason it can be easily encoded in programs to run machines.

(Egbu, Botterill, & Bates, 2001) Explained that tacit knowledge as type of knowledge that refers to underlying skillful actions and follows the saying: it is easier to show than tell. Tacit knowledge generated in the body, and developed by experiences, thoughts and beliefs of an individual (Nonaka, Kodama, Hirose, & Kohlbacher, 2014).

2.2. Knowledge Creation Process and KM Dimensions

(Hammami & Alkhaldi, 2012) Demonstrated that knowledge management from business standpoint aims at enhancing the quality of business activities by managing and supporting various formal information existing inside and outside an enterprise so it could be considered as a business process not a technology so new knowledge was

constructed as a result of business processes, and it is one of the most important corporate assets Knowledge management research has seen a variety of conceptual models and dimensions advanced. According to (McAdam & McCreedy, 1999) they considered these dimensions as models of KM. Because these models express different dimensions of KM and represent a definite conception in the discussion of knowledge management, it is reasonable to classify these as dimensions instead of presenting them as models.

Knowledge creation has been explained by the SECI model, developed by (Nonaka & Takeuchi, 1996), and later improved through the addition of new and interesting suggestions like the concept of Ba (Nonaka & Konno, 1998) and (Hammami, Kassem, & Alhousary, 2015) and the notion of knowledge assets (Nonaka, Toyama, & Konno 2000). The SECI dimension illustrated in Figure (1) serves as a useful starting point in understanding this dimension of KM and how knowledge creation occurs as a flow from tacit to explicit knowledge and a combination of knowledge push and pull.

(Nonaka, Toyama & Konno 2000) Explained the process as beginning with a Socialization phase, sharing and exchange of tacit to tacit knowledge.

The next process referred to externalization where tacit to explicit communication among people through dialogue. Combination defined as a third process where knowledge converts from explicit to explicit. Explicit knowledge can be easily hold, transfer and associate with other explicit knowledge in order get new explicit knowledge (Nonaka, Kodama, Hirose, & Kohlbacher, 2014).

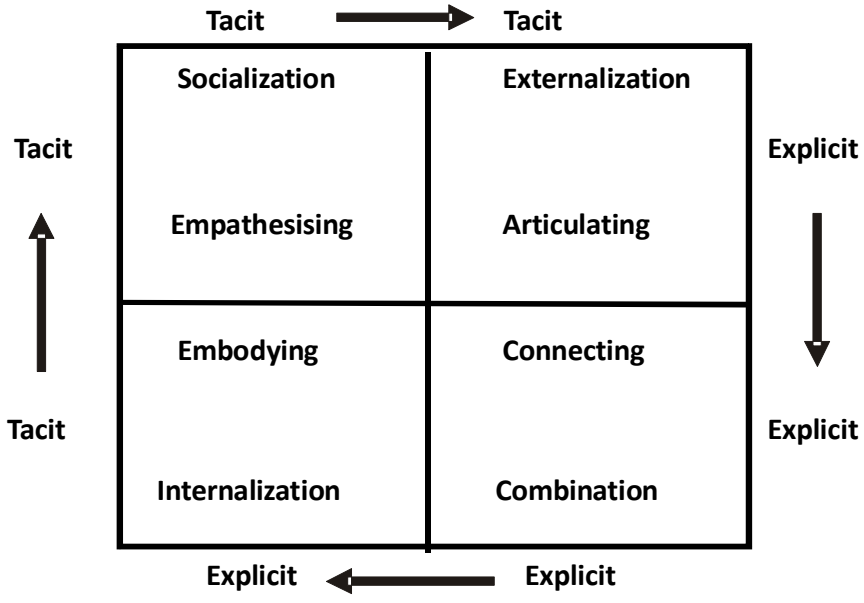

Figure 1: The engine of knowledge creation, model exhibiting categorical dimension of KM adopted for (Nonaka, Toyama & Konno 2000) and (Hammami, Kassem, & Alhousary, 2015)

The last process is internalization where knowledge converts from explicit to tacit. This leads to people internalizing the knowledge whereby they test and then reform in their mind how this knowledge is use and how it can be usefully deployed as demonstrated by (Nonaka, Toyama & Konno 2000).

2.3. eLearning

ELearning the use of information and communication technology as a method for knowledge interchanges within teaching and learning (ŠiËanská & Žiaková, 2014). (Bedrule-Grigoruþã & Rusu, 2014) Mentioned that theses learning and teaching activities provided via electronic channels and media, such as Internet, Intranet, Extranet, CD-ROM, T, phones, personal computers, also (Ravanelli & Serina, 2014) Discussed eLearning provide important opportunities for universities to support a more comprehensive, open and democratic access to learning resources, reducing the social gap that is sometimes associated with face to face teaching; moreover (Comerchero, 2006) argued that eLearning is efficient because it eliminates distances and subsequent travels.

The definitions of eLearning mentioned above encompass several forms of eLearning and it has several types which could be identified according to (Gyambrah, 2007):

1) A means of communication: The common features of these applications enable users to conduct synchronous and/or asynchronous communication, share common educational resources.
2) ELearning used as a general resource. This is the use of computers and internet Based resources and services to enable students for instance learning through interactive eLearning units and rich media sources, using speech, video or interactive sequences or instructions.
3) ELearning used as Learning Management Systems (LMS) which is a software that deploys, manages, tracks and reports on interactions between learner and content and between the learner and the teacher.

These forms have influenced the nature of how people learn.(Vaccaro, Veloso, & Brusoni, 2009) argued that most effective eLearning environment promotes self-learning through appropriate coaching, it has encouraged more individuals to learn by themselves and to only learn what they really need to know or to perform their task optimally.

2.4. Elearning And Knowledge Management

The common characteristics of eLearning and knowledge management support a constructive, open, dynamic, interconnected, distributed, adaptive, socially concerned, and accessible of knowledge (Lau & Tsui, 2009), evidently; knowledge management tools in eLearning environment help learner to present and share ideas, explore their thinking, and obtain knowledge from other learners (Zhang, et al., 2015) .

In other hand (Hammami, Kassem, & Alhousary, 2015) argued collaboration and community tools that have the functions of groupware, email communication, chat-rooms, forums and bulletin boards, which all related to eLearning tools help the learner to create knowledge through knowledge collaboration and sharing (Yordanova , 2007), in addition; (Zhiqiang, 2007) explained that eLearning and knowledge management not always associated however, some common points as well as differentiation can be identified.

ELearning and knowledge management seeking to the same goal of initiating a learning organization (Sousa & Pinto, 2013), moreover; According to (Mustea, Muresan, & Herman, 2014) eLearning and knowledge management assess how successful the users are in knowledge learning and in the case of the knowledge management the users are assessed also with respect to their ability to share and reuse the knowledge.

3. RESEARCH MODEL AND HYPOTHESIS

This model provides a conceptual relation between, Ba (as a shared context) and eLearning environment, as shown in Figure (2). This model tries to confirm that eLearning environment can supports processes consistent with Nonaka's model for knowledge creation.

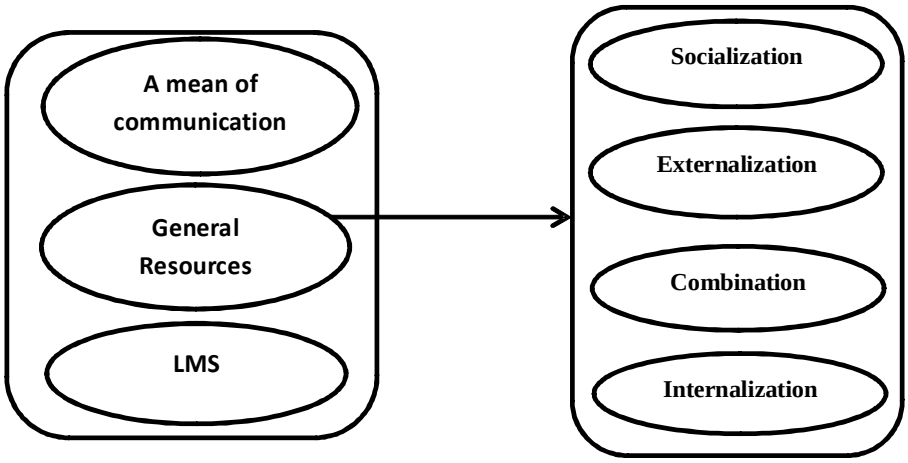

Figure 2: Proposed Model

The proposed model shown in Figure (2) contains two types of variables:

1. Independent variables: eLearning variables, which consist of three variables: A mean of communication, General Resources, LMS.
2. Independent variables: Knowledge creations (SECI Model), which consist of four variables: socialization, externalization, combination, internalization.

The researchers in this study proposed hypothesis based upon proposed model and according to the literature review. The main propositions of this study are illustrated below:

- **H_0:** there is a significant relationship between eLearning environment and SECI model.
- **$H_{0.1}$:** there is a significant relationship between a mean of communication and SECI model.
- **$H_{0.2}$:** there is a significant relationship between general resource and SECI model.
- **$H_{0.3}$:** there is a significant relationship between LMS and SECI model.

4. RESEARCH METHODOLOGY AND ANALYSIS

In order to validate research model we adopted the survey method, the questionnaire is served as a primary tool for data collection of Syrian Virtual University students in (Damascus, Aleppo, and Lattakia) branches. Data collected, in order to determine the correlation degree between the current study variables. The questionnaire was developed and administered to investigate the relationship between eLearning environment and knowledge creation processes.

The number of questionnaire that distributed to the students of (SVU) was (325); the numbers of received questionnaire were (233). Which means the response rate was (71%).

4.1. Analysis Method

Statistical Package for the Social Sciences (SPSS), statistical analysis tool was used in this study. The researchers selected statistical analysis methods that are suitable for the paper objectives. Multiple Regression analysis used to test the relationship between dependent and independent variables.

4.2. Measurement Model

Factor Analysis is used to measure the research constructs. Internal consistency reliability test is used to know whether the instruments are consistent, this reliability is tested for instrument after the factor analysis test. Cronbach's Alpha (á) is the most common method in testing the internal consistency.

The proposed model was evaluated, hypotheses were tested, and the results summarized in table 1. Assessment was done first by Factor analysis in order to measure proposed model construct, The final factor analysis showed right discriminate validity for the eLearning environment and SECI Model, which load five factors range from (0.528-0.871) for eLearning, and load five factors range from (0.422-0.827) for SECI Model. The accepted guidelines for identifying significant factor loading according to (Norman & Streiner, Biostatistic: The Bare Essentials, 2008), (0.30) was accepted as the out-off point for the interpretation purpose.

The second assessment was done by measuring the reliability construct for the context of eLearning environment and SECI were tested by calculated Cronbach's Alpha, Cronbach's Alpha for the first construct eLearning environment was (0.798), and (0.809) was for SECI Model, which shows a reasonable reliability for these constructs.

Table 1
Results Summary Based on Factor Analysis and Cronbach's Alpha

No of construct	*Sub construct*	*No of Item*	*Loading*	*Cronbach's Alpha*
1	eLearning Environment			
1.1	A mean of communication	4	0.608-0.824	0.798
1.2	A general resources	5	0.528-0.788	
1.3	LMS	5	0.624-0.871	
2.	SECI Model			
2.1	Socialization	5	0.505-0.827	0.809
2.2	Externalization	5	0.422-0.768	
2.3	Combination	4	0.609-0.826	
2.4	Internalization	5	0.690-0.827	

Finally the Hypothesizes were tested by using multiple regression. Hypothesizes testing results generated by SPSS.

Table (2) illustrates the multiple regression analysis results of the (A mean of communication, A general resources, LMS) as independent variables on the (SECI Model) as dependent variable. Table (2) shows that (F=144.993), which is considered to be significant at (0.000). These findings indicate that the model that relates independent variables with dependent variable is significant model.

Table (2) indicates that R square is (0.593), which is considered significant at (0.000). The multiple regression findings indicated that there is a significant and positive relationship between eLearning Environment as represented by (A mean of communication, A general resources, LMS) and knowledge creation which presented by (SECI).

These findings provide empirical support for accepting hypothesis H0, H0.1, H0.2, and H0.3.

Table 2
Multiple Regression between (a mean of communication, general resource, LMS, and eLearning environment)

Variables	*Beta*	*T Value*	*R^2 Sig.*	*F*	*Value*	*Sig.*	*Results*
A Mean of Communication	0.185	4.197	0.000	0.593	144.993	0.000	Accepted
General Resource	0.513	10.381	0.000				Accepted
LMS	0.201	4.265	0.000				Accepted

5 DISCUSSION

This section discusses results of hypothesis (H_0, $H_{0.1}$, $H_{1.2}$, and $H_{1.3}$) and attempts to answer the question of the research which is the way that can eLearning affect knowledge creation using SECI Model.

The researchers hypothesized that there is a significant statistical relationship between eLearning environment and SECI Model. The results show a significant and positive relationship between the eLearning environment and SECI Model. Where the eLearning environment interpret (59.3%) of the variation in the SECI Model.

These results support the researchers' assumption; the capacity of eLearning environment to create conditions enhances knowledge creation.

Multiple regression analysis used in order to test the relationship between the eLearning environment, and its dimensions (A mean of communication, A general resources, LMS), and knowledge creation (SECI Model).

All answers concerned with eLearning environment were positive. Specifically the results of testing the eLearning environment dimensions (The respondents expressed the level of agreement with questionnaire questions by ranking them from (1 to 5), where (1) represent strongly disagree and (5) represent strongly agree) which were:

1. The direction of respondent answers was generally positive about a mean of communication. The average was (4.03).
2. The direction of respondent answers was generally positive about general resource. The average was (3.95).
3. The direction of respondent answers was generally positive about LMS. The average was (3.95).

Academics and practitioners alike consider eLearning systems to be a valuable knowledge sharing and transfer tool.

Syrian Virtual University adopted several means that facilitate knowledge process creation such as, virtual class**,** e-mail, discussion forums, learning management system and other technologies that allow them to communicate without having to be in the same place at the same time.

6. FINDING AND CONCLUSIONS

Tacit knowledge and meaningful explicit knowledge seems to be best implanted and shared in an eLearning environment. This study intended to provide insights to consider that eLearning environment encourage processes and created conditions consistent with Nonaka's model of knowledge creation (Nonaka, Toyama & Konno 2000).

ELearning environment required students to share, construct and utilize knowledge through socialization, externalization, combination, internalization.

Socialization: In SVU, several fields of interaction were in place, when students begin introducing themselves on the bulletin board or discussions forum. (Terzieva, 2014) Support that tacit knowledge can be attained through dialogue, and sharing of best practices and lessons learned and these will support socialization process.

Externalization: The mode of knowledge creation in SVU was typically seen in the process of explaining an idea in the group discussion and email system that related to students activities, revolving around dialogue and group thinking or reflection. These techniques help conversation of tacit to explicit knowledge, by express ones ideas or images as words, concepts, and visuals (Nonaka & Konno, 1998).

Combination: combination process activated when connecting discrete elements of exchanging and synthesizing explicit knowledge through such media as documents, meetings virtually, or different computer network enabled communications. (Nonaka, Toyama & Konno 2000) Believed that creative use of computerized communication networks and large-scale databases can facilitate this mode of knowledge conversion.

Internalization: eLearning environment provides autonomy and freedom for internalization process which embodying explicit knowledge into tacit knowledge through reflection and action. SVU students engaged in using electronic resources (ex. digital library) (Rosenberg, 2003), LMS and discussion forum, particularly in situation where students had to deal with a common problem such as accomplishing an assignment, they analyze the situation and discuss possible solutions. (Chen & Lin, 2014) and (Nonaka, Toyama & Konno 2000) Discuss that internalization process related to learning by doing by using information technology tools.

Syrian virtual university offers a collaboration tool that can be used for creation of a group of students performing the same learning task. The collaboration of the group members in the task resolution enhances the learning process effectiveness, speeds up the capturing of knowledge by students and supports natural evolvement of a new knowledge as a result of synergic interaction of the group members.

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