

## Knowledge internalization in e-learning management system

Zahraa Abed Aljasim Muhisn<sup>1</sup>, Mazida Ahmad<sup>2</sup>, Mazni Omar<sup>3</sup>, Sinan Adnan Muhisn<sup>4</sup>

<sup>1</sup>Computer center, Al-Qasim Green University, Iraq

<sup>2,3,4</sup>School of Computing, Universiti Utara Malaysia, Malaysia

### Article Info

#### Article history:

Received Aug 28, 2019

Revised Jan 13, 2020

Accepted Feb 21, 2020

#### Keywords:

eLMS

Explicit knowledge

Internalization

Knowledge management

Tacit knowledge

### ABSTRACT

Knowledge management (KM) is gaining significance as a worthy research subject due to its contribution to the success of wide range of organizations, including higher education institutions. Knowledge internalization is mainly related to capability to see the relevance of one's knowledge in a real situation. e-learning management system (eLMS) provides an online teaching and learning platform for students (as novice users) and lecturers (as experts in their specific domains) with the potential to improve students' knowledge acquisition. Thus, this empirical study was conducted to investigate the impact of knowledge internalization in eLMS among students in Iraq. To achieve these aims, survey research design was adopted and the sample comprised of 109 undergraduate students attending College of Information Technology in Iraq, all of whom were actively engaged in eLMS activities. The findings show that knowledge can be effectively transferred from lecturers to students via eLMS. Additionally, eLMS enable students to improve their prior knowledge through the internalization process, while also motivating them to share their knowledge with other students.

*This is an open access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.*



### Corresponding Author:

Zahraa Abed Aljasim Muhisn,  
Computer center,  
Al-Qasim Green University,  
Babylon city, Al-Qasim District, Postal code 964, Iraq.  
Email: zahraa.a@uoqasim.edu.iq

## 1. INTRODUCTION

The evolution of information, communication, and technology (ICT) based tools has made learning more convenient, interesting, and engaging experience [1]. Knowledge management (KM) provides a systematic process to help in the creation, transfer, and application of knowledge across the higher educational institutions [2]. In recent years, e-learning management system (eLMS) has emerged as a valuable educational tool, which can be adopted when developing an ICT based learning environment [3]. ICT plays a vital role in sustaining the knowledge management processes, such as acquisition, sharing, conversion, and application of knowledge [4]. The convergence of KM and eLMS fosters a constructive, user friendly, interconnected, dynamic, open, distributed, and adaptive, platform offering a wealth of easily accessible knowledge [5]. Consequently, Rowley pointed out that the eLMS has become an important step in the KM systems development [6].

Other studies [7, 8] as a part of which the authors investigated the relationship between eLMS and KM revealed that eLMS provides intercommunication facilities aimed at specific topics, while KM system enables collaboration with experts and other users on different topics. Nevertheless, studies in knowledge internalization (KI) in teaching and learning process by using eLMS are still at infancy stage due to more research are emphasized on student's performance. More researches are needed to demonstrate independence students'

skills in term of learning, thinking and decision making. Thus, the main aim of this study is to provide empirical evidence of KI using eLMS in one of the universities in Iraq from these three skills-learning, thinking and decision making.

#### Review of eLMS

e-Learning has become an integral part of modern education, as it offers diverse means for students' to access and manipulate information and develop new knowledge [9]. The term 'e-Learning' refers to learning through electronic networks via the Internet, which connects the eminent academicians and learners from different parts of the world [1]. Findings yielded by extant studies in this field revealed that the implementation of effective eLMS can promote academic achievement and interest in learning [10]. eLMS supports collaborative leaning methods, which refers to a collaborative activity of two or more learners who are working on achieving collective goals through the exchange of knowledge, learning, and reaching a consensus [11]. As a result, eLMS has an important impact on the higher education [12]. The main advantages of implementing e-Learning in higher education include information accessibility, efficient interactions, improved cooperation and collaboration, cost-efficiency, and adaptability [12].

According to Solangi [13], eLMS benefits from the exploitation of advanced innovations, such as tablets, smartphones, broadband Internet, and social media, all of which have provided affordable learning opportunities for students anytime from anywhere. Numerous studies, such as [14-16], have been conducted on eLMS applications in Iraq. Furthermore, some authors have also examined barriers to eLMS adoption in higher education in Iraq and other countries [9, 12, 17, 18].

#### Knowledge management

Knowledge management (KM) is typically defined as the art of deploying knowledge assets by creating, sharing, collecting, and aggregating knowledge valuable to the organization to enhance employee competencies [4]. When examining KM, it is important to distinguish between tacit and explicit knowledge, as the former is simply the knowledge gathered from experience, making it difficult to document and transfer to others [19]. On the other hand, explicit knowledge can be easily understood, communicated and shared, and thus applied in practice [20]. The relationship between explicit and tacit knowledge [21] involves four modes of knowledge conversion, as indicated by the SECI (socialization, externalization, combination, internalization) model shown in Figure 1.

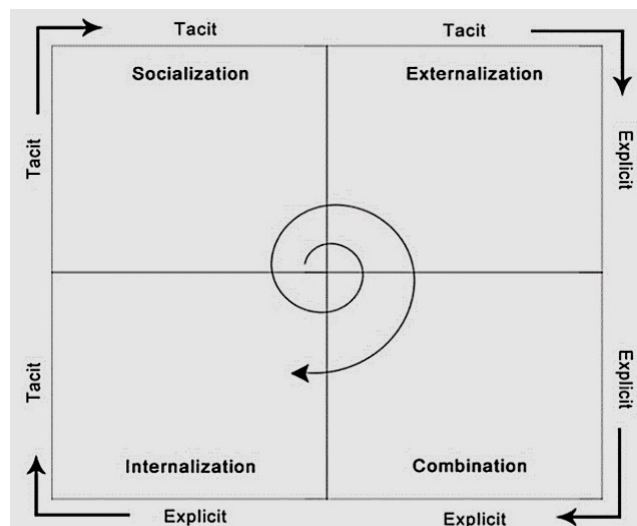


Figure 1. The SECI model [21]

Socialization (tacit knowledge to tacit knowledge transfer) is a process of sharing experiences, which creates tacit knowledge, such as shared mental models and technical skills. This is done through practice, imitation, and observation. Externalization (tacit knowledge to explicit knowledge conversion), on the other hand, relates to models and hypotheses or concepts. Combination (explicit knowledge to explicit knowledge) involves combining different bodies of explicit knowledge, while internalization (explicit knowledge to tacit knowledge conversion) is a process of embodying explicit knowledge into tacit knowledge and is closely related to "learning by doing" [22]. The knowledge spiral in Figure 1 shows how knowledge is transformed from tacit to explicit and then again to tacit during various phases of knowledge

sharing. These phases should be implemented in sequence to ensure that tacit knowledge can be transferred from an expert to a novice [21].

#### Internalization in eLMS

The internalization process occurs when the complex and structured explicit knowledge becomes tacit knowledge at organizational level via the combination process [23]. According to Kolb [24], this organizational knowledge helps individuals share their experience with other individuals and apply it in real situations or in simulated environments. Newly gained experience allows an individual improve or strengthen the existing tacit knowledge. In another study [25], a learning model was developed that is particularly relevant to higher education. This model contains four steps that form a continuous cycle, denoted as concrete experience, observation and reflection, formation of abstract concepts, and concept testing in real situations.

The model explains that learning begins through self-experience or experience of other individuals based on organizational knowledge. The next step involves assessment of the effects of actions based on application of previous experiences in similar situations. Next, individuals' are required to select the most appropriate actions through the experiences in different situations, which will form the basic principles for future guidance. The final step involves the application of these principles to new related situations.

The outcome of the application improves and compliments individual's tacit knowledge. Moreover, its effects ignite a new learning process that elevates the involved individuals' tacit knowledge. The transition through different knowledge levels determines the effectiveness of the individual's tacit knowledge [26, 27]. These continuous steps lead towards a new dynamic knowledge creation at individual, group, and organizational level. Based on the experience-based learning model, can be surmised that the internalization process consists of transferring and sharing of comprehensive and structured organizational explicit knowledge, which is then organized into individual's tacit knowledge, thereby strengthening the existing tacit knowledge and generating new tacit knowledge among individuals in the organization.

In the study focusing on the new industrial context [28], the authors proposed an internalization exploratory framework involving (1) organizational external environment, and (2) individual internal factors, both of which determine the learning lifecycle [25, 27]. The aim of this process is to realize knowledge internalization that emphasizes the ability of applying as well as creating knowledge. Knowledge internalization is related to the ability to see value in the transferred knowledge, that is, to understand knowledge as something efficient and useful for organizational routines. Indeed, empirical evidence indicates that recognizing the value of knowledge is the premise for motivation to learn [29].

In this context, external environment refers to the environmental changes that expose individuals in the organization to new problems to which the existing solutions are not applicable. This requires organizations to internalize new knowledge among employees to handle the challenging new environment. Tsai and Lee [28] outlined the best approaches to respond to changes in the external environment:

- Deploying observation and trying to ascertain the reasons behind changes (observation, know-why).
- Understanding what needs to be done and suggesting appropriate techniques to respond to the changes in the environment (concept formation, know-what).
- Implementing approaches that are most likely to address the problem in practice (testing concepts in real situations, know-how)
- Strengthening the gained experiences through interactions with changing environments (concrete experience, care-why).

However, for any strategy to work, individuals must have a desire to engage in the learning process to create new knowledge. Individuals that have a strong desire for learning are motivated to analyze the changes in their environment, find the solution to the observed problems and apply those in real situations, thus further increasing and strengthening the existing organizational knowledge [28]. This learning cycle results in knowledge internalization that comprises of the ability to apply as well as create knowledge. The complex and structured explicit knowledge created via the combination process is organized into learners' tacit knowledge in a continuous cycle of a learning theory [25]. It involves:

- Concrete experience
- Observation and reflection
- Formation of abstract concepts and generalization
- Testing of the concepts' implications in new situations

The model proposed by [25] is appropriate for measuring the learning patterns and training offered to computer science [30], engineering [31], and medical [32] students to improve their ability to create knowledge. For example, Simon [30] used the model in determining a learner's success in computer assessments, while Sharp [31] found that the model could improve collaborative skills among learners. On the other hand, [32] utilized the model to identify the most appropriate learning pattern for increasing medical students' performance.

According to Gerholm [33], tacit knowledge in educational field is the knowledge that covers daily routines at the organizational level, the ability to interpret the lecture content, as well as the decision making and thinking independence the individual level. To sustain the competitive advantage, organizational tacit knowledge that is formed from learners' tacit knowledge should be dynamic to fit the market or industrial needs that are always changing. For example Zeng [33] posited that tacit knowledge is comprised of two levels, i.e., (1) knowledge gained directly-created through the link between previous tacit knowledge and the input in the new situation, and (2) knowledge gained indirectly-through the development of structure and understanding gained by solving problems.

In the educational context, according to Gerholm [33], learners' tacit knowledge is gained directly by applying the previous tacit knowledge in new situations. It is also gained indirectly during the problem-solving process (i.e., independence of learning, independence of thinking, and independence of decision making). Based on the discussions presented thus far, learners' tacit knowledge is measured in terms of independence of learning, thinking, and decision making.

eLMS and knowledge management

A study by [34], pointed out that eLMS considered an effective tool for acquiring knowledge because it helps to extract the implicit knowledge in order to improve the exchange of knowledge. On the other hand, Shrestha and Kim [35] are of view that eLMS users should adopt KM and apply KM techniques to the eLMS system to improve and enhance the e-Learning process. According to Tessier and Dalkir [36], KM system content can function or be considered as an e-Learning content repository, as in both cases users must register to access relevant information. As Gable [37] pointed out, eLMS can be used to achieve the SECI model of knowledge transfer, as described in the most widely used KM model.

A study by [8], revealed the compared the functionalities of KM and eLMS, as well as explored the relationship between these two domains. They found that, in educational contexts, internalization requires organization of explicit knowledge formed through discussions among lecturers and learners to transform teaching materials into learners' tacit knowledge. Having analyzed the problem, learners make decision on the best action to take when solving the problem, and apply the solution in real situations. Through application, learners create their tacit knowledge that can be shared in a group, which is further stored as organizational tacit knowledge.

## 2. RESEARCH METHOD

In this research, a quantitative survey research design was adopted in order to understand the impact of e-learning management system on the knowledge management among students in Iraq. According to [38], the survey research allows determining the relationship between several factors. Similarly, Leedy and Ormrod [39], pointed out that the survey research design is a suitable method when the research aim is to identify the causal relationship between independent and dependent variables.

The survey research design was therefore adequate for the present study because pertinent data could be obtained via a set of questionnaires developed by [19] based on SECI model [21] that focus on how knowledge is transferred through the internalization process among students. The study sample included 109 undergraduate students attending College of Information Technology at a public university in Iraq. Data collection for this study was carried out during February 2019 by distributing 11-item internalization questionnaires to the participants. All items, which tap into individual's perception, required a response on a five-point Likert scale, ranging from 1= "Strongly Disagree" to 5= "Strongly Agree", as shown in Table 1.

Table 1. Five-point likert scale

Likert-Scale	Interval	Difference	Description
1	1.00-1.79	0.79	Strongly disagree
2	1.80-2.59	0.79	Disagree
3	2.60-3.39	0.79	Neutral
4	3.40-4.19	0.79	Agree
5	4.20-5.00	0.80	Strongly agree

## 3. RESULTS AND DISCUSSION

The survey involves 109 respondents, comprising of 39 males and 70 females. Majority of the students were between 19 to 23 years old. The gathered data was analyzed using statistical package for social science (SPSS) and the reliability of the instrument was 0.852. Descriptive statistics as shown in Table 2. Table 2 shows the descriptive statistics for the items related to the internalization process among

students, indicating that the highest average score was obtained for question 11: "I decide based on what I feel is right" ( $M = 4.12$ ,  $SD = 1.18$ ). This was followed by question 6: "I discuss with friend to get better understand" ( $M = 3.97$ ,  $SD = 1.23$ ), while the lowest average score was obtained for question 1: "I do not depend on lecturer to study" ( $M = 2.42$ ,  $SD = 1.54$ ). The findings show students highly dependent on their lecturers to gain new knowledge in the beginning of the learning process. Then, they will explore by themselves once they internalize their independence skills.

Table 2. Descriptive statistics

Questions	Stroly Disagee	Diagree	Do not agree neither disagree	Agree	Strongly agree	Mean	Std. Deviation	Rank
1 I do not depend on lecturer to study.	N 48 % 44%	14 12.8%	19 17.4%	9 8.3%	19 17.4%	2.42	1.53535	11
2 I do not depend on friend to study.	N 31 % 28.4%	18 16.5%	29 26.6%	9 8.3%	22 20.2%	2.75	1.46664	3
3 I find other material for study via Internet.	N 13 % 11.9%	12 11%	22 20.2%	24 22%	38 34.9%	3.57	1.37684	5
4 I always contribute ideas to the group discussion.	N 12 % 11%	19 17.4%	32 29.4%	25 22.9%	21 19.3%	3.22	1.25726	9
5 I frequently refer to external sources for additional information.	N 22 % 20.2%	13 11.9%	32 29.4%	23 21.1%	19 17.4%	3.04	1.36033	10
6 I discuss with friend to get better understanding.	N 4 % 3.7%	13 11.9%	19 17.4%	20 18.3%	52 47.7%	3.97	1.22821	2
7 I compare information from several sources before make my own assumption.	N 13 % 11.9%	15 13.8%	27 24.8%	24 22%	30 27.5%	3.39	1.34039	8
8 I corrected my friends' mistake.	N 9 % 8.3%	11 10.1%	23 21.1%	23 21.1%	43 39.4%	3.73	1.30272	4
9 I try to relate things that I have learned with daily life.	N 13 % 11.9%	12 11%	26 23.9%	26 23.9%	32 29.4%	3.48	1.33747	7
10 I combine the information gathered before come up with my own opinion.	N 13 % 11.9%	15 13.8%	18 16.5%	26 23.9%	37 33.9%	3.54	1.39132	6
11 I decide based on what I feel is right.	N 7 % 6.4%	3 2.8%	19 17.4%	21 19.3%	59 54.1%	4.12	1.18419	1
Average Result						3.39	.61520	

After examining the tabulated results, it can be noted that the total weighted average score was 3.39 with  $SD = 0.62$  which means that Neutral is the general trend according to the 5-point Likert scale as shown in Table 1, since 3.39 lies in the 2.60-3.39 interval. These results are depicted in Figure 2. The findings further indicate that students mostly utilize the eLMS to collaborate with other team members as the system is available anywhere at any time. Nevertheless, students still need lecturer/mentor to guide them in understanding the academic subjects. The results similarly indicate that e-learning provides a platform for lecturers and students to interact and collaborate without the limitations imposed by time and place. Despite the benefits offered by the eLMS, students still require the assistance of lecturers to guide them in better understanding particular subjects or topics.

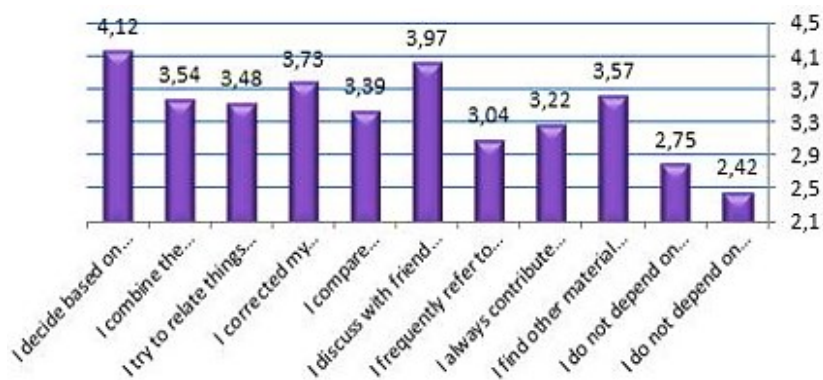


Figure 2. The responses of sample respondents are about Internationalization

#### 4. CONCLUSION

The present study has revealed that ICT can be used to create, store, and share both tacit and explicit knowledge as described by the SECI model. Internalization in KM occurs when complex and structured explicit knowledge is combined to create tacit knowledge. This process is crucial in assisting individuals to share their knowledge with others in real situations or in simulated environments. Through internalization, knowledge is seen as valuable in promoting learners' motivation to learn and appreciate knowledge. e-learning management system (eLMS) is a particularly useful tool, as it promotes knowledge internalization in the area of education and is aligned with the SECI model. Through eLMS, lecturers and students are connected in an online environment, which enables them to share knowledge. This, in turn, improves students' learning, and enhances their collaboration and interaction skills. Future works may explore other SECI processes such as socialization, externalization and combination in LMS context.

#### REFERENCES

- [1] C. Selvaraj, "Success of E-Learning Systems in Management Education in Chennai City-Using User's Satisfaction Approach," *Online J. Distance Educ. e-Learning*, vol. 7, no. 2, pp. 124, 2019.
- [2] V. Kumaravel and P. Vikkraman, "Assessment of Knowledge Management Practices in Higher Educational Institutions in India: A Structural Equation Modeling Approach," *Int. J. Educ. Sci.*, vol. 20, no. 1-3, pp. 120-136, 2018.
- [3] T. Usagawa, "Effectiveness of E-learning Experience through Online Quizzes: A Case Study of Myanmar Students," *Int. J. Emerg. Technol. Learn.*, vol. 13, no. 12, pp. 157-176, 2018.
- [4] H. S. Hashim and Z. A. AL-Sulami, "Promoting Successful Knowledge Management Processes Integrated Into Information Technology in Higher Education Universities in Iraq," *J. Theor. Appl. Inf. Technol.*, vol. 96, no. 24, 2018.
- [5] M. D. Lytras, A. Naeve, and A. Pouloudi, "A knowledge management roadmap for e-learning: the way ahead," *Int. J. Distance Educ. Technol.*, vol. 3, no. 2, pp. 68-75, 2005.
- [6] J. Rowley, "Is higher education ready for knowledge management?," *Int. J. Educ. Manag.*, vol. 14, no. 7, pp. 325-333, 2000.
- [7] J. Al-Sadi, B. A. Shawar, and T. H. Sarie, "The Relationship Between Knowledge Management and e-Learning," in *CSREA EEE*, pp. 514-518, 2008.
- [8] P. Kalyanaraman, S. M. Anuncia, and V. Balasubramanian, "An Investigation on E-Learning Tools and Techniques Towards Effective Knowledge Management," in *Knowledge Computing and its Applications*, Springer, pp. 335-346, 2018.
- [9] M. Al-Shboul, "The level of e-Learning integration at The University of Jordan: Challenges and opportunities," *Int. Educ. Stud.*, vol. 6, no. 4, pp. 93-113, 2013.
- [10] T. Govindasamy, "Successful implementation of e-learning: Pedagogical considerations," *internet High. Educ.*, vol. 4, no. 3-4, pp. 287-299, 2001.
- [11] O. Sumtsova, et al., "Collaborative learning at engineering universities: Benefits and challenges," *Int. J. Emerg. Technol. Learn.*, vol. 13, no. 1, pp. 160-177, 2018.
- [12] A. Al-Azawei, P. Parslow, and K. Lundqvist, "Barriers and Opportunities of E-Learning Implementation in Iraq: A Case of Public Universities," *Int. Rev. Res. Open Distrib. Learn.*, vol. 17, no. 5, 2016.
- [13] Z. A. Solangi, F. Al Shahrani, and S. M. Pandhiani, "Factors affecting Successful Implementation of eLearning: Study of Colleges and Institutes Sector RCJ Saudi Arabia," *Int. J. Emerg. Technol. Learn.*, vol. 13, no. 6, pp. 223-230, 2018.

- [14] A. Al-azawei, P. Parslow, and K. Lundqvist, "The Effect of Universal Design for Learning ( UDL ) Application on E-learning Acceptance : A Structural Equation Model," *Int. Rev. Res. Open Distrib. Learn.*, vol. 18, no. 6, pp. 54-87, 2017.
- [15] A. A. J. K. ALRadhi, "Information professionals in a globalized world: Distance learning/E-learning for Iraq: Concept and road map," *Bull. Am. Soc. Inf. Sci. Technol.*, vol. 34, no. 3, pp. 34-37, 2008.
- [16] A. S. Elameer and R. M. Idrus, "National E-Learning Strategy to Enhance and Enrich the Iraqi Universities.," *Online Submiss.*, 2011.
- [17] G. E. Ali and R. Magalhaes, "Barriers to implementing e-learning : a Kuwaiti case study," *Int. J. Train. Dev.*, vol. 12, no. 1, pp. 36-53, 2008.
- [18] A. Jokiah, et al., "Barriers to using E-Learning in an Advanced Way," *Int. J. Adv. Corp. Learn.*, vol. 11, no. 1, pp. 17-22, 2018.
- [19] M. Ahmad, et al., "Knowledge Transfer in Software Engineering Education using SECI Model," *Int. J. Inf. Process. Manag.*, vol. 5, no. 1, pp. 28, 2014.
- [20] Y. Yilmaz, "Knowledge Management in E-Learning Practices.," *Turkish Online J. Educ. Technol.*, vol. 11, no. 2, pp. 150-155, 2012.
- [21] I. Nonaka and H. Takeuchi, "The knowledge creation company: how Japanese companies create the dynamics of innovation." New York: Oxford University Press, 1995.
- [22] R. Abdullah, M. H. Selamat, A. Jaafar, S. Abdullah, and S. Sura, "An empirical study of knowledge management system implementation in public higher learning institution," *Int. J. Comput. Sci. Netw. Secur.*, vol. 8, no. 1, 2008.
- [23] K. Ichijo and I. Nonaka, "Knowledge as competitive advantage in the age of increasing globalization," *Knowl. Creat. Manag. New challenges Manag. Oxford Univ. Press. Oxford*, pp. 3-10, 2007.
- [24] I. Nonaka, N. Konno, and R. Toyama, "Emergence of Ba: A conceptual framework for the continuous and self-transcending process of knowledge creation," *Knowl. Emerg. Soc. Tech. Evol. Dimens. Knowl. Creat.*, pp. 13-29, 2001.
- [25] D. A. Kolb, "Management and the learning process," *Calif. Manage. Rev.*, vol. 18, no. 3, pp. 21-31, 1976.
- [26] C. Argyris, "Good communication that blocks learning," *Harv. Bus. Rev.*, vol. 72, no. 4, pp. 77-85, 1994.
- [27] J. B. Quinn, P. Anderson, and S. Finkelstein, "Managing professional intellect: making the most of the best," *Strateg. Manag. Intellect. Cap.*, vol. 87100, 1998.
- [28] M.-T. Tsai and K.-W. Lee, "A study of knowledge internalization: from the perspective of learning cycle theory," *J. Knowl. Manag.*, vol. 10, no. 3, pp. 57-71, 2006.
- [29] H. Aquino and J. M. de Castro, "Knowledge internalization as a measure of results for organizational knowledge transfer: proposition of a theoretical framework," *Tour. Manag. Stud.*, vol. 13, no. 2, pp. 83-91, 2017.
- [30] S. J. Simon, "The relationship of learning style and training method to end-user computer satisfaction and computer use: A structural equation model," *Inf. Technol. Learn. Perform. J.*, vol. 18, no. 1, pp. 41, 2000.
- [31] J. E. Sharp, "Teaching teamwork communication with Kolb learning style theory," in 31st Annual Frontiers in Education Conference. Impact on Engineering and Science Education. Conference Proceedings (Cat. No. 01CH37193), vol. 2, p. F2C-1, 2001.
- [32] E. Ferguson, D. James, and L. Madeley, "Factors associated with success in medical school: systematic review of the literature," *Bmj*, vol. 324, no. 7343, pp. 952-957, 2002.
- [33] T. Gerholm, "On tacit knowledge in academia," *Eur. J. Educ.*, pp. 263-271, 1990.
- [34] C. Zeng, "e-Learning: The new approach for knowledge management," in Proceedings of International Conference on Computer Science and Software Engineering, pp. 291-294, 2008.
- [35] M. S. Islam, S. Kunifuji, M. Miura, and T. Hayama, "Adopting knowledge management in an e-learning system: Insights and views of KM and EL research scholars," *Knowl. Manag. E-Learning An Int. J.*, vol. 3, no. 3, pp. 375-398, 2011.
- [36] S. Shrestha and J. M. Kim, "Bridging the Gap between E-Learning and Knowledge Management (KM): An enhancement of Moodle system by applying KM Functions," *Int. J. Sci. Technol.*, vol. 2, no. 1, pp. 104-111, 2013.
- [37] D. Tessier and K. Dalkir, "Implementing Moodle for e-learning for a successful knowledge management strategy," *Knowl. Manag. E-Learning*, vol. 8, no. 3, pp. 414-429, 2016.
- [38] G. G. Gable, "Integrating case study and survey research methods: an example in information systems," *Eur. J. Inf. Syst.*, vol. 3, no. 2, pp. 112-126, 1994.
- [39] P. D. Leedy and J. E. Ormrod, "Practical research: Planning and design (8th ed.)," New Jersey, USA: Pearson: Merrill Prentice-Hall., 2005.