Towards The Use of Advance Technology in E-Learning: A Review

Hesham Fakrany, Merza Abbas & Ebtisam Alqhtani

Centre for Instructional Technology and Multimedia, Universiti Sains Malaysia, Penang, Malaysia

hesham.fakrany@hotmail.com, merza@usm.my, ebtisam.alqhtani@hotmail.com

Abstract— E-learning is the use of technology to enable people to learn anytime and anywhere. The use of latest learning technology in e-learning comprises all forms of electronically supported learning and teaching. The information and communication systems, whether networked learning or not, serve as specific media to implement the learning process. In this paper we introduce the current status of the technology use in e-learning by looking at different e-learning technologies and briefly discuss its effects in learning. It then explains five related studies that addressed the impact from using a definite technology in e-learning. We aim to acknowledge the current status o using technology in e-learning.

Index Terms—ICT, e-learning, technology, LMS

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1 INTRODUCTION

THE current issues in teaching programming language among university students have discussed by different researchers as the need to provide an alternative support to help those students interact with learning content. Such aspect comes under the classification of blended learning which refers to the various teaching strategies, which focus on understanding how the user interacts with the computer during a particular task, and how the computer fits into the scheme of the user's total job or environment (the system) [1].

From the other hands, the wide perspective of presenting learning contents in e-learning among learners has addressed and specified the main problem of these presentation techniques over the Web that e-learners may be operating during the teaching process [2]. Online learning applications designed and developed by following a certain strategy for processing and displaying user queries are accessible on the Internet. Nevertheless, most of learners find their self not familiar with the unlimited pedagogical representations, and this may affect their way of understanding and interacting with the content, especially in teaching programming language which demands different learning and design requirements. In addition, instructional designers of e-learning environments need to take into account the various patterns for providing users with the desired representation to teach programming language. Furthermore, the query process also depends on the way knowledge is represented.

This leads to the need to carry out an evaluation and adoption of teaching associated methods among learners. The importance of adaptation in teaching plays a significant role in the utilization of technology during learning. In e-learning environments, there are primarily two types of adaptations: a)

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• *Hesham Fakrany is currently pursuing PhD degree program at Universiti Sains Malaysia, Malaysia. E-mail: hesham.fakrany@hotmail.com.*

to client device, and b) to client activity [3].

An alteration to learner behaviour means that the learning environment should fit the learner's assumptions. For that, learners usually face difficulties in understanding the learning materials, which cause them to search for alternate ways to access and represent knowledge so that they can browse through content that fits their needs. In other words, learning environment-based-technology should fit different learners and learning styles [4].

2. LITERATURE

Abdullah, Sufian and Nantha in [5] investigated the problems of learning programming subjects. They also explorerd the various attempts made to solve teaching and learning problems. They propsoed the use of virtual pair programming (VPP), which was used to provide a synchronous mode of collaboration between learners. They studied the effectiveness of asynchronous VPP in the learning of object-oriented programming among students at Open University Malaysia (OUM). They found that most of the learners have given positive feedback, indicating that they are happy with the use of asynchronous VPP.

Hadjerrouit in [6] introduced the effects of blended learning tools in helping learners to understand the new programming language. He addressed the current issues faced by learners from using the face-to-face learning with information technologies that found to be lacked in providing an effective teaching and efficient solutions for learning. Thus, he referred in his study different learning theory and pedagogical strategies. After reviewing these theories and strategies, he found that there is still a need for design-based research approach to blending learning through successive cycles of experimentations, where the shortcomings of each cycle are identified, redesigned, and reevaluated. He also used blended learning model in Java programming at the introductory level. It presents the design, application, and evaluation of the approach and its implications for the learning of introductory computer programming.

Zin, Othman and Yue in [7] focused on content for e-learning based on embedding pedagogical aspect in learning activities and processing. Zin and others presented features of learning activity in an e-learning system called Learning Activities E-Learning Management System (LAE-LMS) based on level of processing in Instructional Management Systems Global Learning Consortium Learning Design (IMS LD) Conceptual Model. This system allows teacher to plan, manage and monitor learning activities, while students carry out the activities. LAE-LMS consists of five modules: registration module, synopsis module, authoring module, monitoring module and learner module. Acceptance testing showed that teachers and learners have high positive perception on security, suitability, accurateness and satisfaction of the features of LAE-LMS.

Zhong in [8] intended to determine how a definite strutual representation of learning contents in e-learning based pedagogical strategies helps students develop better understanding of contetn classification. The students were asked to examine the pedagogical strategies employed by different teachers in 5 primary classes. The findings indicated that integrated use of multimedia resources, teacher scaffolding and provocative questions focusing on classification criteria, as well as students' collaborative learning have impacted on students' learning that could enhance students' understanding of animal classification.

Srimathi and Srivatsa in [9] described the benefits of e-learning systems among university students as 1) delivering and managing educational elements through Web-based applications, creating a useful learning environment; and 2) customising information in an educational environment while allowing control over learning. Srimathi and Srivatsa aimed to design an interactive learning application with simple context objects using the power of e-learning principles. The feasibility study used the derived Instructional Design Template for further incorporation with the Sharable Content Object Reference *Model* (SCORM) model. The usage of SCORM principles helped to enhance the quality of representation of e-learning content.

Stary and Totter in [10] assessed the examination process to provide learners with the capability to control the selection and presentation of content, as well as the learning process, according to their needs, learning styles and preferences. They employed two e-learning design theories, both strengthening learner self-control, but developed on different grounds and following different patterns. It was reported that both approaches revealed several types of learner control to be helpful in self-managed learning.

Another study highlighted the representation learning contents in a number of virtual learning environments (VLEs) that were used specifically in educational fields as demonstrated by [11] the importance of VLEs as a learning method; such VLEs depend on the integration of ICT components into a formal representation of learning contents. Meanwhile, the study examined the suitability of presenting the textbook contents over VLE in higher education, along with traditional lectures, in a professional safety engineering course. Figure 2.7 shows the proposed VLE Virtu learning structure.

A study conducted by [12] deployed agents through the e-learning environment. They aimed to enable numerous users to coordinate collectively and intelligently with the proposed learning environment. The development of the e-learning system involved the interaction of users with the system, adopting an artificial agent combination. The system structure was geared towards working within actual Internet/intranet settings. The conceptual structure was classified into three parts: characteristic learning space, collaborative space and cooperative space. The system was combined with the agent-based approach as a suitable solution to assess these elements. Finally, Harbouche and Djoudi used a certain methodology to design the agent-based approach.

Latif, Hassan and Hasan in [13] developed an effective interaction protocol requirement for automating document downloading and notification in an e-learning system. They presented three main agents in system development: the e-learning agent, lecturer agent and student agent. The protocol was characterised using ISLANDER editor as the graphical authentication, which aims to monitor the correctness of the fundamental interaction protocol using the Electronic Institution (EI) approach. However, the protocol focused on one-to-one agent interaction through identifying learners' relations with the content. The e-learning performance structure is shown below.

Study	System based architecture	Support e-learning activities	Virtual Learning Environment	Support distributed network	Support Instructor	Enable command view
[5]	✓	✓	✓		✓	
[6]	✓	✓			✓	
[7]	✓	✓		✓	✓	✓
[8]	✓	✓			✓	
[9]	✓	✓	✓		✓	✓
[10]	✓		✓		✓	✓
[11]	✓		✓	✓		✓
[12]	✓		✓			✓
[14]	✓	✓			✓	✓
[13]	✓		✓		✓	✓
[15]	✓	✓	✓	✓	✓	

3. Conclusion

This study showed the different implication of various learning tools in e-learning. The study emphasized the ability of conducting online learning on the current technological status. Finally we distinguished between these implications by comparing different studies conducted based on the use of technology in learning.

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