ENHANCING UNIVERSITY TEACHERS' INFORMATION AND COMMUNICATION TECHNOLOGY USAGE BY USING A VIRTUAL LEARNING ENVIRONMENT TRAINING COURSE

Ageel, Mohammed[1], Woollard, John[2]

[1] University of Jazan (SAUDI ARABIA)
[2] University of Southampton (UNITED KINGDOM)
mohammed.ageel@hotmail.com, j.woollard@southampton.ac.uk

Abstract

The research project is a case study focussing on the use of a virtual learning environment (VLE) implemented to increase the use of information and communication technology (ICT) by university teachers in Jazan University, Saudi Arabia. The study aims to investigate the effect of the VLE as the vehicle for a training course in ICT designed to improve the university teachers' ability to use ICT in their teaching through continuing professional development (CPD) programmes.

The raison d'être of the study is that most university teachers do not use ICT in their teaching [1]. The training programme is delivered through a VLE course (based on Moodle), and so places the teachers in the position of learners and draws their attention to the benefits that can be gained by using ICT in their teaching. The study addresses the following question: can a VLE affect the use of ICT by teachers to support their teaching? Two questionnaires were used as data collection methods, a pre-test and post-test adopted before and after the implementation of the VLE.

The analysis of the results of the study reveals that there are differences between the pre-test and the post-test, for the benefit of the post-test. The mean of the university teachers' ICT usage in the pre-test is 1.94 and for the post-test is 2.59. The study recommends that the university policy makers should support the use of a VLE in the CPD provision and to create more ICT training programmes. Finally, the policy makers should consider some training programmes for the students to support and enhance their competence in using ICT for the purpose of learning.

Keywords: information and communication technology (ICT), virtual learning environment (VLE), continues professional development (CPD).

1 INTRODUCTION

The advances in information and communication technology (ICT) have greatly influenced its integration into the education curriculum as a means of developing students' academic performance. The primary aim of integrating ICT is to facilitate students and teachers in the learning and teaching process [2]. Ageel identified that a majority of university teachers are still reluctant to make use of ICT in their teaching; this is mainly due to lack of skills as well as knowledge of the ICT functionalities [1]. It is through the use of virtual learning environment (VLE) in training that teachers can be given the opportunity to make use of these software systems and eventually develop the skills necessary for the adoption of such systems. Today, educational institutions should be able to provide their teachers the opportunities to make use of ICT in real life situations. The aim of this research is to determine if VLEs could in any way affect the ICT usage of teachers from Jazan University (Saudi Arabia) in improving and supporting their teaching. This research aims to investigate the effect of a VLE as a training course in ICT to improve the university teachers' ability to use ICT in their teaching through continues professional development (CPD) programmes.

2 LITERATURE REVIEW

Today, increasing numbers of educational institutions make use of various types of technologies in order to provide students with learning tools and teachers with pedagogical tools to enhance the learning and teaching processes. This section provides a brief but precise discussion of the three most important factors salient to the current study - ICT, VLEs and CPD - and the relevance and relationship of each factor to the development of the usage of ICT in improving and developing the pedagogical skills as well as technological literacy of educators in Saudi Arabia.

2.1 Information and Communications Technology

In general the term ICT is defined as the "technology used to handle information and aid communication" [3]. Furthermore, ICT may play a part in achieving the universal goal of education as specified by the European Licence/ International Computer Driving Licence Foundation, that is in "enriching the educational experience of students" as well as contributing to "increasing the productivity of teachers around the world" [4]. Consequently, this recognises how useful ICT is, not only for the development of students' learning, but also for teachers' pedagogic skills.

Khan found that the level of competency of lecturers and trainers was enhanced, when they made use of various ICT-based hardware and software, which gave them the capability to deliver a more enhanced graphics-oriented presentation of lectures [5]. Furthermore, it was found that if institutions and trainers/lecturers are provided more time to develop quality instruction, teachers are more able to efficiently develop and prepare lectures, examinations and tests, lecture materials, presentations and monitor student's progress more quickly.

The integration of ICT in education not only provides assistance and guidance for teachers, it also provides the opportunity for more teachers to make use of various types of technologies in order to enhance their instruction. Bailey et. al. found that if the use of multimedia, laboratories, workshops or studios became prevalent among schools or universities it promoted learning [6]. Furthermore, ICT also allows both teachers and learners, to make use of different types of communication devices such as e-mails, bulletin boards, newsgroups as well as chat in communicating additional instructions beyond the classroom [7]. This is both useful and beneficial for both the students and the teachers, as this mode of communication would be both effective and continuous.

Moreover, in addition to access to various types of tools, it is also found that with access to information and communications technologies, teachers are provided the opportunity to gather relevant information and data easily as resources for lessons [8]. This also applies to students, with access to various ICT tools; students are provided the opportunity to gather information about lessons and homework through various online databases [7]. Not only will teachers gain access to various types of information, the use of ICT in education also reveals that ICT-based tools provides opportunities for teachers to provide immediate feedback to their students [9], where the immediacy of the results is highly beneficial to both.

In this review, it is evident that the field of education does greatly benefit from the integration of various information and communications technologies, providing opportunities for swift and effective communication in both the teaching and learning processes.

2.2 Virtual Learning Environment

A VLE is "a collection of integrated tools enabling the management of online learning, providing a delivery mechanism, student tracking, assessment and access to resources" [10]. From this definition it can be said that in general a VLE is a learning environment that is composed of various types of technologies that provides assistance for students as well as teachers in their corresponding functions inside the classroom. Today, with the advancement and development of society, a wide array of VLEs is easily accessible to everybody.

One of the many uses of VLEs is that they provide opportunities for the designers to make use of various learning tools such as course announcements, online course documents, online or database self-assessment tests as well as making use of other online examination forms, and links to web pages that can aid learning [11]. These tools provide students with the ability to make use of such resources that are not only convenient but also immediate. This is why more and more fields are integrating VLEs into their own learning and training environments.

Virtual learning environments comprise many different types, out of which the WebCT is identified as one of the best course management system, providing various types of learning tools that include: "discussion board, course content searches, a course calendar, electronic mail, auto-marked quizzes, navigation tools, access control, grade maintenance and distribution, users progress tracking" [12]. It is considered that because this type of VLE promotes cooperative learning, encouraging learners to control their own learning according to their own learning styles. Moodle, another type of VLE, provides opportunities for its users to modify their own programs and is said to be an "Open Source platform" [13] available to everybody free of charge and can be "installed, used, modified and even distributed" [13].

What makes VLEs effective is that they focus on the learners themselves rather than on the instruction or the program itself [14]. This characteristic of VLEs is what distinguishes them from traditional methods of teaching where it is not always possible to deliver one-to-one in a group situation. In a VLE, the primary focus is the student and their varying needs; the student becomes the centre of the learning itself [14]. Consequently, it is found that not only are VLEs applicable and effective inside the classroom, they are also an effective means of delivering seminars and training alike.

The need to improve or reform training or seminars is one of the reasons why VLEs are considered for integration into fields such as professional development, particularly in teaching. The primary aims of the programs are to impart not only knowledge about VLEs, but also the skills needed for the utilization of such inside the classroom [15]. Furthermore, the effectiveness of VLEs as teaching tools has been identified by Al-Ajlan who states that VLEs as teaching tools could provide university teachers with the opportunity to make use of modern technology as a pedagogical tool as well as a means of enriching their knowledge, with the aim of improving and developing the university teachers themselves [16]. Not only will university teachers experience first-hand virtual programs but they would also be provided the opportunity to make use of these effective learning environments in their own classrooms. All in all it could be inferred that a VLE, in both the classroom and the professional development environment, provides opportunities for students and, most importantly, for teachers to develop their positive experiences with technologies or virtual tools with the aim of attaining their educational goals through enhanced and effective pedagogical tools.

2.3 Continuous Professional Development

In general CPD is said to deal with the professional development of a particular workforce and as such is an effective way of continuously improving, as well as developing and enhancing, the skills and knowledge of professionals. The field of education is one of the professions that consider greatly the benefits of CPD and its value in life-long learning programmes. Continuing professional development provide opportunities that enable teachers to efficiently gain the skills and knowledge required to incorporate new teaching methods within their course design [17]. Such interaction is important, for it forms the basis for research and adoption of new and effective approaches to lecturing [18], even as they interact and share information amongst themselves as continuing learners.

The growth and development of a teacher as a whole can be valuably assisted by CPD, as according to Guskey professional development aims to deliver training that provides organized efforts in the aim of improving classroom practices as well as beliefs and attitudes towards learning [19]. Modern technology has greatly influenced education in integrating such innovation into the teaching and learning process. The rapid advances in technology and its continuous development is one of the reasons for teachers to undergo CPD in order to keep up with these advances.

The presence and availability of technologies has opened the way for university teachers to make use of such types of teaching tools inside the classroom. But since this is new, specific skills as well as knowledge are needed in order for them to appreciate and make use of this type of learning instruction. Ming et. al. suggested that one of the reasons for the reluctance of university teachers to integrate ICT into their classroom is because of the lack of skills and training in using ICT [20]. Ming et. al. argued that university teachers should undergo CPD in ICT to enable them to successfully integrate ICT into their mode of teaching [20]. Furthermore, Pervaiz & Spielvogel judged that educators, as stakeholders in education, should undergo CPD and that this should be the main priority of any education reform [21]. Moreover, it is mentioned that “both technical knowledge and the ability to integrate ICT into the curriculum are important” [21] to facilitate the adoption of ICT into the education curriculum.

In Saudi Arabia, development in the economy has been of primary focus, however as time has passed the Saudi government has realised that in order to improve the economy it should first improve the quality of human resources that the Saudi universities produce [1]. Therefore, there is a need for the continuing development in higher education institutions.

Continuing professional development provides an avenue through which university teachers develop a sense of appreciation of the developments that have been made in instructional methods as well as the benefits associated with the use of ICT in today’s classrooms. Another factor that underpins the important role played by CPD in increasing ICT usage in higher institutions of learning is the flexibility that is characteristic of ICT. Information and communication technologies represent one of the most dynamic facets of human development. Usability of ICT facilities depends on the knowledge that a

user has of the technical specifications and operations, the nature of the user interface used by a technology and user's ability to relate current to past technologies.

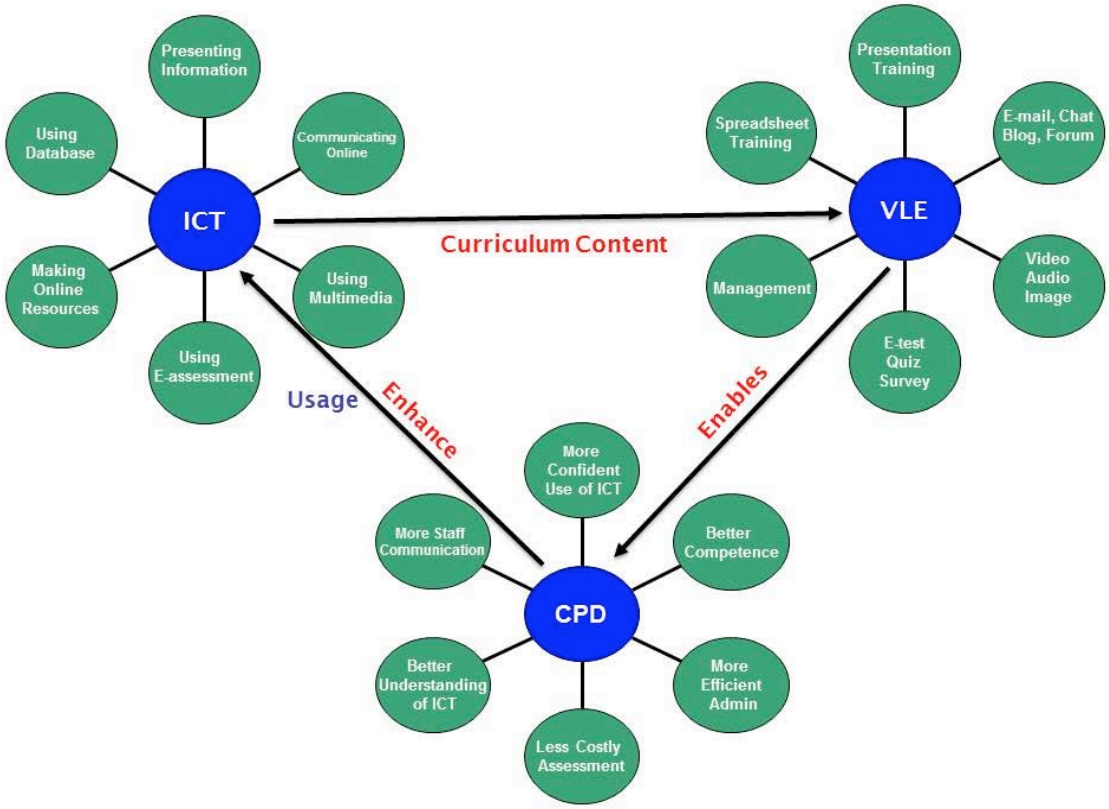

Figure 1 Research Framework

The study is underpinned by the literature described and the concepts are represented in the research framework (See Figure 1). It provides an overview of the different uses of ICT, VLE and CPD in education. The framework shows the relationship between the ICT curriculum and the role of the VLE in enabling its utilisation and the nature of the university teachers' CPD designed to enhance the usage of ICT inside classrooms**.**

3 METHODOLOGY

This quantitative research brings light to bear on the effect of a VLE as a training delivery mechanism to improve teachers' ability to use ICT in their teaching. The sample group was identified through convenience sampling. The senior administrator in each of the 8 schools of the university requesting 5 volunteers to participate in the research. The invitation was presented as an 'opportunity' to participate in the VLE training course regarding 'the use of ICT to support teaching and learning' although the research had the status of administration approval. All schools provided 5 volunteers and no further action was needed to obtain the 40 respondents. The issue of sample bias is considered in the final discussion. The privacy and confidentiality conditions of the ethical protocol (University of Southampton, 2010) were made clear. The respondents were entitled to make a voluntary and informed decision to take part in the study and they were assured that they were free to withdraw at any point during the study. After the respondents had been identified, they received a Moodle VLE training course. The materials used in the Moodle programme course training are adopted from the ICT course. Meeting with respondents were arranged at their convenience.. The VLE programme lasts for six weeks and consisted of the following courses: the use of ICT in online communication; presentation/ instruction; using multimedia; using e-assessment and making online resources as well as using databases. Furthermore, in order to provide real time opportunities for the teachers to make use of the range of information and communication technologies, VLE courses offer the utilisation of blogs, chats, forums, e-assessment videos, audios, presentations, websites and documents files. These tools are not only used to provide the educators with hands on experience with such devices or services, it also provides the trainers support and assistance in each of the six courses. In order to

reduce bias in the research results, a consistent number and percentage of participants are used pre and post-test.

4 RESULTS

This section presents the results of the analysis of the participants as well as the pre-test and post-test questionnaires disseminated before and after the 6-week programme. The sample consisted of 40 participants (5 from each of the 8 schools) with each group of 5 having the same academic specialisation.

The pre-test was conducted with the 40 participants prior to the 6 week VLE training programme after which a post-test was conducted with the same participants. Table 2 presents the results of the analysis of the pre-test and post-test questionnaires. These results reveal that before the VLE training programme started, a majority of the university teachers make use of ICT mainly for Microsoft PowerPoint presentations with a mean of 1.82. While the least used ICT tool are blogs with only a mean of 1.05. The result of the post-test is shown in Table 2 and reveals that after the VLE training programme, a majority of the university teachers make use of ICT database programs with a mean of 2.45. While the least used ICT tool is synchronous chat with only a mean of 1.95. Whether or not there is a statistical difference between the pre and post-tests is determined through a t-test paired sample test. Table 3 provides a detailed result of the paired sample t-test of both the pre- and post-tests. These data reveal that there is a statistical difference between the pre- and post-tests. Furthermore, since the mean in the post-test is greater than the pre-test it could be inferred that there is a greater increase in the level of usage of ICT among university teachers after undergoing the VLE training programme.

Table 2 ***Results of pre-test and post-test using ICT***

ICT Source		Frequency			Mean	Standard Deviation	Rank
		Always	Some-times	Never			
Internet	Pre-Test	3 (7.5%)	22 (55%)	15 (37.5%)	1.70	0.61	3
	Post-Test	13 (32.5%)	25 (62.5%)	2 (5%)	2.28	0.55	7
E-mails	Pre-Test	1 (2.5%)	14 (35%)	25 (62.5%)	1.40	0.55	8
	Post-Test	22 (55%)	12 (30%)	6 (15%)	2.40	0.74	2
Video Conference	Pre-Test	0	7 (17.5%)	33 (82.5%)	1.18	0.38	13
	Post-Test	14 (35%)	24 (60%)	2 (5%)	2.30	0.56	6
Word Processing	Pre-Test	2 (5%)	19 (47.5%)	19 (47.5%)	1.57	0.59	6
	Post-Test	15 (38.5%)	19 (48.7%)	5 (12.8%)	2.26	0.68	9
Data Base Programs	Pre-Test	0	14 (35%)	26 (65%)	1.35	0.48	9
	Post-Test	21 (52.5%)	16 (40%)	3 (7.5%)	2.45	0.64	1
Digital Video Camera	Pre-Test	0	9 (22.5%)	31 (77.5%)	1.23	0.42	11
	Post-Test	11 (28.9%)	22 (57.9%)	5 (13.2%)	2.16	0.64	14
Scanner	Pre-Test	1 (2.5%)	16 (40%)	23 (57.5%)	1.45	0.55	7
	Post-Test	13 (33.3%)	19 (48.7%)	7 (17.9%)	2.15	0.71	15

Educational Computer Programs	Pre-Test	1 (2.5%)	12 (30%)	27 (67.5%)	1.35	0.53	9
	Post-Test	19 (47.5%)	17 (42.5%)	4 (10%)	2.38	0.67	3
CDs	Pre-Test	0	27 (67.5%)	13 (32.5%)	1.68	0.47	4
	Post-Test	20 (51.3%)	11 (28.2%)	8 (20.5%)	2.31	0.80	5
Synchronous chat	Pre-Test	0	3 (7.5%)	37 (92.5%)	1.08	0.27	15
	Post-Test	9 (23.7%)	18 (47.4%)	11 (28.9%)	1.95	0.73	17
Forums	Pre-Test	0	3 (7.5%)	37 (92.5%)	1.08	0.27	15
	Post-Test	15 (37.5%)	21 (52.5%)	4 (10%)	2.27	0.64	8
Blogs	Pre-Test	0	2 (5.0%)	38 (95%)	1.05	0.22	17
	Post-Test	17 (43.6%)	15 (38.5%)	7 (17.9%)	2.26	0.75	9
PowerPoint	Pre-Test	2 (5.1%)	28 (71.8%)	9 (23.1%)	1.82	0.51	1
	Post-Test	14 (35%)	20 (50%)	6 (15%)	2.20	0.69	12
Slides	Pre-Test	2 (5.0%)	22 (55%)	16 (40.0%)	1.65	0.58	5
	Post-Test	15 (38.5%)	19 (48.7%)	5 (12.8%)	2.26	0.68	9
Overhead Projector	Pre-Test	1(2.6%)	28 (71.8%)	10 (25.6%)	1.77	0.48	2
	Post-Test	16 (41%)	12 (30.8%)	11 (28.2%)	2.13	0.83	16
Smart board	Pre-Test	0	9 (22.5%)	31 (77.5%)	1.23	0.42	11
	Post-Test	19 (47.5%)	16 (40.0%)	5 (12.5%)	2.35	0.70	4
Educational Software	Pre-Test	0	6 (15%)	34 (85%)	1.15	0.36	14
	Post-Test	17 (42.5%)	14 (35.0%)	9 (22.5%)	2.20	0.79	12

Table 3 ***Paired Sample Test***

Factor	Mean	Std. Deviation	t-value	Sig.(2-tailed)	Eta^2 (Eta Squared)
Pre-test	1.94	0.26	18.03	0.000 (0.01)	0.89
Post-test	2.59	0.31			

5 DISCUSSION

The results of the data analysis reveal various implications with regard to the effect of the VLE training program in the usage of ICT among the university teachers. The results of the analysis of the pre-test of the participants revealed that before the VLE training programme most university teachers made use of presentations, overhead projectors and the internet, whereas the least used are blogs. The post-test results revealed that after the 6 week VLE training program, the teachers made use of the following ICT: database programs, email and educational computer programs and the least used being synchronous chats. In comparing and analysing the results of both the pre- and post-test, it could be said that the VLE training programme enhanced and expanded not only their knowledge and skills but also their choices when it comes to making use of ICT in their teaching. Similar findings have been identified in other literature, citing that VLEs provide opportunities for university teachers to make use of a wide array of ICT [16] [11]. Furthermore, the results also indicated that VLEs are effective in the field of professional development because of the notable statistical difference between the pre- and post-test results. This is also found to be true according to one study, the primary aim of the programme was to impart not only knowledge about VLEs, but also the skills needed for the utilisation of such within the classroom [15]. Significantly, the results indicate how important and effective CPD is to university teachers' growth, not only in skills development but also ICT knowledge acquisition. These findings are similar to those of Guskey [19] who stated that professional development aims to provide organized efforts in improving classroom practices as well as beliefs and attitudes towards both the teaching and learning processes. Furthermore, the results revealed that there is a statistical difference between the pre- and post-tests.

6 CONCLUSION

This study is aimed at investigating the effect of a VLE as a CPD training course in ICT to improve university teachers' ability to use ICT in their teaching. The result from the study reveal that the mean in the pre-test is 1.94 and for the post-test is 2.59 indicating a difference in the university teachers' ICT usage. This positive result demonstrates a higher and notable increase in the university teacher's use of ICT. This implies that the VLE training programme was effective in the development and enhancement of usage of ICT among university teachers at Jazan University.

In the light of these positive outcomes the current study recommends that the university policy makers should support the use of VLE in the CPD programmes of teachers and create more ICT training programmes. Furthermore, the university teachers are identified to be in need of more ICT skills improvement trainings and programmes in order to further improve and develop their skills in ICT usage. Finally, the policy makers should consider training programmes for the students to enhance their competence of using ICT to support their learning processes.

REFERENCES

[1] Ageel, Mohammed (2011) The ICT Proficiencies of University Teachers in Saudi Arabia: A Case Study to Identify Challenges and Encouragements. Hummingbird, *University of Southampton's Doctoral Research Journal*, **8(2)** pp.55-60.

[2] van Gelder, T., 2001. How to improve critical thinking using educational technology. *Meeting at the Crossroads*, Retrieved from <http://www.ascilite.org.au/conferences/melbourne01/pdf/papers/vangeldert.pdf> [Accessed 24 December 2011].

[3] Boudreau, M.C., Loch, K.D., Robey, D., & Straub, D., (1998). Going Global: Using information technology to advance the competitiveness of the virtual transnational organization. Academy of Management Executive, **12(4),** pp.120-128.

[4] European Computer Driving Licence/ International Computer Driving Licence Foundation, (2008). ECDL/ ICDL: Digital Literacy for Education. pp18-20.

[5] Khan, B., 2001. Virtual U: A Hub for Excellence in Education, Training, and Learning Resources. In: B. Khan, ed., Web-base training. Englewood Cliffs, N.J.: Educational Technology Publications, pp. 491-506.

[6] Bailey, L., L., Day, C., Day, T., Griffin, A., Howlett, P.,Kane, M., Kirk, C., McCullough, N., McKiernan, B., McMullen, T., Perfect, K., Ramsey, E., & Wood, R. (2004) Using ICT in Schools: Addressing Teacher Workload Issues. Nottingham: Pricewaterhouse Coopers.

[7] Yusuf, M.O., & Onasanya, S.A. 2004. Information and Communication Technology (ICT) and Teaching in Tertiary Institutions. Teaching in Tertiary Institutions, pp. 67-76.

[8] Katz, I.R. 2005. Beyond Technical Competence: Literacy in Information and Communication Technology, Education Technology Magazine, [online] Available at: <http://www.ets.org/Media/Tests/ICT_Literacy/pdf/ICT_Beyond_Technical_Competence.pd> [Accessed 21 December 2011].

[9] Wiggins, G., 1997. 'Practicing what we preach in designing authentic assessments', *Educational Leadership*, **4(54)** pp. 18-26.

[10] University of Warwick. 2006. Using the Virtual Learning Environment. [handout]. England: University of Warwick. pp.11.

[11] Hiary, H., & Abu-Shawar, B., 2009. The Impact of JU Computerized Systems on E-Learning Process. *European Journal of Scientific Research*, **38(2),** pp. 328-336.

[12] Lu, J., Yu, C., & Liu, C., 2002. Learning style, learning patterns, and learning performance in a WebCT-based MIS course. *Information and Management,* **40 (2003),** pp. 497-507.

[13] Franciscato, F.T., Ribeiro, P., Mozzaquatro, P., & Duarte, R., 2007. Assessment of virtual learning environments Moodle, TelEduc, and Tidia-Ae: a comparative study derived from students' experiences in distance learning and traditional teaching. Research, Reflections, and Innovations in Integrating ICT in Education, pp.1270-1274.

[14] Stonebreaker, P.W., & Hazeltine, J.E., 2004. Virtual learning effectiveness: An examination of the process. *The Learning Organization,* **11(3),** pp.209-225.

[15] Sahin, M., Yaldiz, S., Unsacar, F., Yaldiz, Y., Bilalis, N., Maravelakis, N., & Antoniadis, N., 2007. Virtual Training Centre For CNC: a Sample Virtual Training Environment. University of Crete.

[16] Al-Ajlan, A.S. (2008) Service Oriented Computing for Dynamic Virtual Learning Environments. Ph.D. De Montfort University.

[17] Littlejohn, A. H., 2002, 'Improving continuing professional development in the use of ICT', *Journal of Computer Assisted Learning,* **2(18)** pp. 166-174.

[18] Booth, A., Sutton, A. & Falzon, L., (2003) Working together: supporting projects through action learning. *Health Information and Libraries Journal,* **4(20)** pp. 225-31.

[19] Guskey, T. R., 2002. Professional Development. *Teachers and Training: theory and practice*, **8(3/4),** pp. 381-391.

[20] Ming, T.S., Hall, C., Azman, H. & Joyes G., (2010). Supporting Smart School Teachers' Continuing Professional Development in and through ICT: A model for change. *International Journal of Education and Development using Information and Communication Technology,* **6(2).**

[21] Pervaiz, A., & Spielvogel, R., 2006. Ministry of Education, The Education Reform Assistance. National information and communications technology strategy for education in Pakistan.