A STUDY ON E-TRAINING ADOPTION FOR HIGHER LEARNING INSTITUTIONS

Mueen Mohsin

College of Information Technology, UniversitiTenaga National, Kajang, Selangor, Malaysia

Rosnafisah Sulaiman

College of Information Technology, UniversitiTenaga National, Kajang, Selangor, Malaysia

ABSTRACT

Conducting or attending training sessions have become essential for developing the required competencies to fulfil organizations' needs and for individual personal growth. This is also becoming part of developing knowledge society or workers. Most of the organizations are still applying the traditional training approach for human resource training (e.g. employees need to be in a certain place, duration, and with an appointed trainer). However, the traditional training practices consume high cost, less flexibility, and difficult to meet the needs and expectations of participants and the organizations. This research aims to explore the possibility of adopting electronic-training (e-training) concept at the higher learning institutions. The e-training in this research context covers the training provider (the institution) and the trainee (employees) for in-house training or for external participants. UNITEN was used as a case study to identify the requirements and the possibilities to adopt the e-training concept. This research applied the quantitative and qualitative approach that involved survey and interview techniques. The outcome from this research is an e-training adoption framework that could assist an institution to step forward into another level of delivering and engaging knowledge to build knowledgeable and skilful staffs.

Keywords: E-learning, E-training, E-training Awareness, ICT.

1. INTRODUCTION

Continuous training in an organization has become essential to individual personal growth and well-being in developing the required professional capabilities (Frank and Rijkema, 2012). Training was considered as non-productive exercise, but at present, the level of knowledge inside the organizations can hardly keep up with the rapid changes in business needs and technology. In order to face with business change and challenges, such as new technology and high economic competition, it is essential for the organizations to provide education or training to their workforce to upgrade and equip them with the right knowledge and skills (Srinivasan, 2005). Most of the

organizations are still applying the traditional training approach for their employee training programs where the training holds at a certain place, in certain duration and with a trainer presence. The traditional training practices are contributed to several problems such as *high cost*, *lack of flexibility*, and *difficult to meet needs and expectations of participants*. According to (Khademi *et al.*, 2011) traditional training is costly because of time and money spends for traveling and accommodation. It is less flexible because of the training courses can only be held at a specific time and place. In addition, traditional training may have some limitations in terms of designing learning materials that meet the employees' level of knowledge, interest and the needed skills for the job assigned. In University Tenaga National (UNITEN), the training is also conducted in the same manner (traditional approach). The training is conducted either in house (at the university) or at the third party place. The types of training are various and based on the applicants' needs such as soft skills, technical skills, or knowledge-based training that may fall under different areas such as IT, engineering, business as well as for support processes. Based on the description above, it can be seen that having an intermediate technology for training such as e-training could solve some of the issues above. Therefore, this study aims to look for the possibility of adopting e-training in an organization, in particular a higher learning institution where teaching and learning mostly takes place.

2. LITERATURE REVIEW

A few topics were reviewed in this study such as the e-learning and e-training concepts, the differences between these two concepts, the issues and challenges in current practices and existing frameworks.

2.1. Definitions of E-Learning, Training and E-Training

E-learning

E-Learning was defined in many ways and in different context. E-learning is defined as "*encompasses any type of learning content that is delivered electronically*" (Bowles, 2004). This concurs with the definition of the American Society for Trainers and Development (ASTD) that defines e-learning as "*instructional content or learning experiences delivered or enabled by electronic technology*" (Hambrecht, 2001). Fallon and Brown, (2002), defined the e-learning as "*any learning, training or education that is facilitated by the use of well-known and proven computer technologies, specifically networks based on Internet technology*". In order to align with the current demand and availability of technology, e-learning provides further enhancements by incorporating a multitude of assets, such as images and videos to produce media-rich, flexible, and interactive courses (Yu and Fan, 2009). Naidu (2006) stated that virtual learning environments motivate learners with multimedia components to capture and visualize real-world scenarios. This allow the learners with some flexibility such as 24 hours and 7 days a week of learning session and accessibility to learning materials in the training system (Bowles, 2004). The description of the E-learning by Fallon and Brown (2002) is adopted as a guide throughout this study. This is because the definition includes the key ingredients for the growing success of E-learning that are the progression in information and communication technologies.

Figure 1 shows that E-learning can be divided in two main categories which are knowledge management and learning. The knowledge management component focuses on the technical aspects, while, learning covers the pedagogical background that comes from the combination of training and education. Training which the focus of this study is considered under the learning category.

Figure- 1. Overview of Fields of Thought and Practice Involved in E-learning (Bowles, 2004)
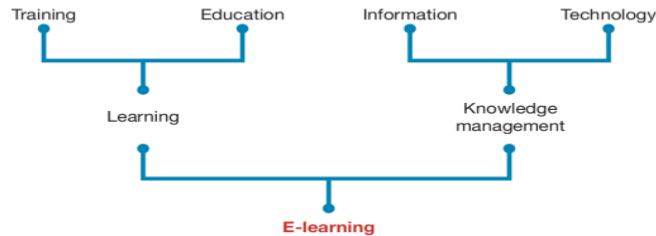
Training

Training is described as "*an activity that changes people's behaviors in an organization. Increased productivity is meant to be the most important reason for training*"(McClelland, 2002). However, training is also essential not only to increase productivity but to motivate and inspire workers about the importance of their jobs and how to perform the jobs as expected as well as part of their career growth (McClelland, 2002). The term 'training' is also defined as "*a planned and systematic sequence of activities usually under the guidance of qualified supervisors*"(Jarvis, 1999; Hickman and Geller, 2003). The aims are to develop knowledge, skills and good behavior pattern required by an individual in order to perform their work adequately and effectively. In addition, ''*training,*'' according to Sloman (2001), ''*is the process of acquiring the knowledge and skills related to work requirements using formal structured or guided means, but excluding general supervision, job specific innovations, and learning by experience.*''. This definition means the training lies within the domain of the organization: it's an intervention designed to produce behaviors from individuals that have positive organizational results (Masie and M.J., 2001).

E-training

Echard and Berge (2008)defined the e-training concept as: "*A separation of trainer from trainee and part of teaching and training through instruction, observations, or processes focused on providing needed skills and knowledge to meet immediate business goals.*". Based on the definitions and descriptions given above, the e-training concept in this research context is defined "*as using technology to deliver knowledge and skills from a trainer (instructor or teacher) to trainees (employee), through a mediator such as the internet, or intranet environment*". These includes special skills such as problem solving, analytical; specialized knowledge, and characters required in order to build successful and knowledgeable employee that in return will benefit the organization.

2.2. The Difference Between E-Training and E-Learning

The Table 1 below describes the difference between e-training and e-learning based on definitions, outcomes, time, target user, paradigm, and measurement (Bernárdez (2002), Bowles (2004), Masie and M.J. (2001), Horton (2000), Suraya, Azizan, et al. (2008), Ramayah, Ahmed et al. (2012).

Table- 1. The Difference between e-training and e-learning

No.	Criteria	E-training	E-learning
1	Definition	Training lies within the domain of the organization: it is an intervention designed to produce behaviours from individuals that have positive organizational results.	Encompasses any type of learning content that is delivered electronically.
2	Outcome	Based on organization needs, typically is used on the professional or corporate.	Learner activities in a structured learning process
3	Time	Short duration	Long duration based on the study program example, degree, diploma etc.
4	Target user	Employees or professional workers	Adult learners
5	Paradigm	Instructional, programmed-instruction paradigm.	Web browsing, self-development paradigm.
6	Measurement	Measurement criteria: usage / cost reduction.	Measurement criteria: learning outcomes.

From the comparison, it can be seen that the e-training concept is more suitable as it emphasizes for training the trainees such as employee and potential participants who seek for short training courses to improve or to acquire new knowledge and skills specifically for job improvement. Whereas, e-learning is more suitable for learners that engage for a long study duration, such as students take a diploma, foundation, degree, or master level.

2.3. Issues and Challenges of E-Training and E-Learning Implementation

There are many challenges and issues that have been highlighted with regards to e-training. (Ali, 2004; Pagram and Pagram, 2006; Ramayah *et al.*, 2012), claimed that there are several issues and challenges of e-training and e-learning implementation that need to be considered as illustrated in Figure 2:
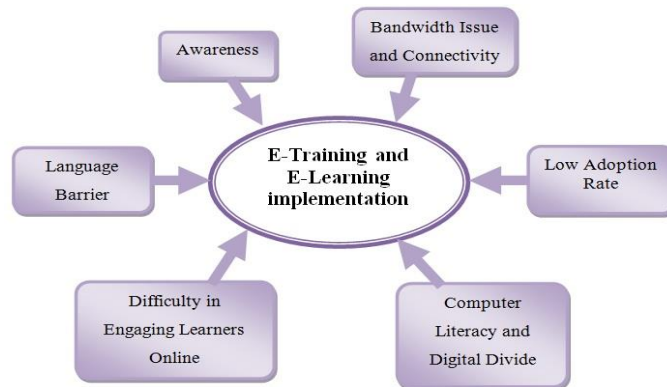
Figure- 2. Issues and Challenges of e-training and e-learning Implementation

Figure 2 shows that there are six main issues and challenges of e-training and e-learning implementation which are *lack of awareness,low adoption rate, bandwidth issue and connectivity, language barrier, difficult in engaging learners online, and lastly computer literacy and digital divide*. In order to enhance the effectiveness of understanding e-training concept, the challenges and the issues need to be overcomed. One of the challenges is to identify the organization's training needs through the use of Information and Communication Technology (ICT) and to ensure the workforce are ICT literate. Training and re-qualification are essential to face the obsolescence of skills, and to modify or adapting production and services to the market in a flexible way. Organizations need to move towards a continuous training system so that it can be well integrated into the working environment and be part of the organization culture. Competence and knowledge management should be closely linked to one another to monitor any corporate needs that require a training to take place (Bagnasco *et al.*, 2003). Due to the circumstances, ICT can broadly be defined as tools, facilities, processes, and equipment that provide the required environment with the physical infrastructure and the services for the generation, transmission, processing, storing and disseminating of information in all forms such as voice, text, data, graphics and video that could assist the delivery of future job assignment or job improvement (Asabere and Enguah, 2012).

3. THE EXISTING FRAMEWORKS AND COMPARISON ANALYSIS

In this section, three existing frameworks from previous studies were reviewed and discussed, as follow:

- The first framework was "*UM In-House E-training Program Framework*" (Azizan, et al., 2008). This framework was developed and customized to cater for the employee of Small-Medium Enterprises (SMEs). The focus of this framework is the relationship between the e-training system and with other components involved in the training process. Currently, the e-training system was used to offer two coursewares namely *the BSC courseware* and *the Technopreneurship courseware*. In this framework, Knowledge Management (KM) components such as *knowledge transfer*, *knowledge sharing*, *knowledge archiving* and *knowledge creation* are incorporated to manage users' learning process. The learning organization is also introduced and expected to evolve over time (Suraya *et al.*, 2008)

- The second framework was "*E-learning (EL) framework"* by Ion (2007). This framework focuses on the use of ICT in order to deliver knowledge and to improve learners' abilities. The core of E-learning is represented by digital content. Students or employee will be part of the system through the Internet and Intranet (Ion, 2007).
- The third framework is Employees' Acceptance of Web-Based Training Framework by Chatzoglou, Sarigiannidis et al. (2009). This framework is used to examine employees' intention in accepting a web-based training program. The Table 2 below shows the advantages and disadvantages of the three existing frameworks.

Table- 2. Advantages and Disadvantages of the Three Existing Frameworks

Frameworks	Advantages	Disadvantages
UM In-House E-training Program Framework	- reduce training cost - customized for SMES - can be assessed anywhere	- The courses in the system are limited and are not based on trainee's needs - No relationship with system developers showed in the framework - Focus on implementation only
E-learning framework (Ion)	- Accessibility for both Intranet and Internet - Provide flexibility in learning time management. - Focus more on trainees.	- No standard used for developing the digital content - Limitation in terms of interoperability and content repository.
Employees' acceptance of web-based training framework	- Provides support for individual assessment before designing a training program. - Customize based on individuals goal orientation to suit with different training designs.	- This study does not include any dynamic changes that may appear after trainees test a web-training program and detail the changes that may occur in trainees' self-efficacy after testing a specific web-training platform. - Only tested with computers only

From the literature review, several criteria were highlighted such as *learners or training–center*, *general components*, *specific components*, *combination of general and specific components*, *behavioral components*, and *awareness or readiness components*, as shown in Table 3 below. These criteria were used to compare the existing frameworks and were also used as a basis for the proposed framework. Table 3 shows that the first framework and the second one have similarity in term of the trainees/ learners are in the center or focus of the system. Further, the first framework highlighted the needs to have a virtual library, e-discussion group, and digital content. In contrast, the third framework was focused on the intention of using e-training system. Based on the previous description of the three frameworks, it can be seen that the most obvious differences are that the first two frameworks (UM In-House E-training Program Framework and E-learning (EL) framework) were not contained any form of awareness about e-training or e-learning approach. On the other hand, although the third framework was gauged the level of trainees' intention towards e-training approach but also the awareness of e-training approach was not part of the framework. Therefore, this research is focused on providing a step of e-training awareness in an organization in the proposed framework.

Table- 3. The Comparison of the Three Existing Frameworks

No	Criteria	UM In-House E-training Program Framework	E-learning framework (Ion)	Employees' acceptance of web-based training framework
1	Learners –centred/ trainees- centred	✓	✓	-
2	General components such as Students, IT infrastructure, hardware, software, and communications networks.	✓	✓	-
3	Specific components such as key performance index (KPI), Several Access Medium, the BSC courseware, the Technopreneurship courseware, and Knowledge Management (KM) components.	-	✓	-
4	Combination of general and specific components	✓	✓	-
5	Behavioral components such as Intention, Perceived Ease of Use, Perceived Usefulness, Computer Anxiety, Self-Efficacy, Enjoyment, Learning Goal Orientation, and Management Support.	-	-	✓
6	Awareness or readiness components	-	-	-

4. METHODOLOGY

This research employed qualitative and quantitative research approaches by using questionnaire and interview methods. The quantitative approach, using questionnaire was used to elicit information from the respective respondents. The respondents of the survey were academic staff, employees of UNITEN, and potential participants of e-training courses. The outcomes of the survey are to determine the level of acceptance and readiness of organization towards the e-training approach. Qualitative research approach using an interview technique was used to support and complement the findings gathered from the survey. In this research, the questionnaire was developed based on a study that was conducted in Greece byChatzoglou, Sarigiannidis et al. (2009).However, it was customized to suit with this research context. The interview was then conducted as semi-structured interview with the officer in-charge at Institute of Professional Advancement (INSPA), UNITEN. Data from questionnaire was analyzed quantitatively and results were used as a basis to develop the proposed framework.

5. RESULT, FINDINGS, AND DISCUSSION

In UNITEN, training is divided into two categories, the in-house training either conducted by the employee to other employee or having invite trainers to conduct training for the UNITEN employee. The second category, short courses are offered to external participants. These short training courses provide the industries with workforce training in a wide range of area normally based on the immediate requirements and tailored to the industries' needs. From the comparison analysis of existing frameworks, a gap can be seen that none of the frameworks are focusing at the early stage of e-training adoption which to create awareness. Thus, this section as shown in Table 4, will discuss in brief the findings that supporting the awareness issues with regards to e-training adoption.

Table- 4. Survey and Interview Results and Findings

Findings	Survey result	Interview result
Awareness on e-training concept	• Respondents have a high level of intention, self-efficacy, and perceived usefulness, perceived ease of use, learning goal orientation measures towards an e-training approach. • Low level of computer anxiety measures towards an E-training system. • Majority of respondents (80%) had agreed and strongly agreed that e-training can be conducted in UNITEN. • Lack of e-training awareness. • Majority (61%) have not attended any e-training courses. • High level of acceptance and readiness towards e-training approach that can be contributed to come out with the proposed framework.	• The current practices of training in UNITEN. • Types of training courses offered by UNITEN. • Lack of awareness of E-training approach. • Still using a traditional training approach.

**Table- 5.** Results on level of Acceptance

Task	Moderate	Agree and Strongly Agree
Intention	21 %	70 %
Self-Efficacy	21 %	73 %
Perceived Usefulness	28 %	65 %
Perceived Ease Of Use	23 %	71 %
Computer Anxiety	14%	17%
Learning Goal Orientation	12%	83%

Based on the discretion of the results and findings, it can be seen that each criteria of the acceptance level has a high of percentage which indicates that trainees are accepted and ready to use e-training. Further, the results and findings were contributed to come out with the proposed framework. Due to the positive despondences of the survey, it can be concluded that e-training approach is highly possible to be conducted at a higher learning institution such as UNITEN. However, most of respondents have not attended any e-training courses before. Thus, the awareness issues will be taken into consideration throughout this study.

6. E-TRAINING ADOPTION FRAMEWORK (ETA)

Figure 3 shows the proposed framework which is known as E-training Adoption (ETA) Framework. This framework provides a step by step approach of developing awareness and readiness towards the e-training concept at a higher learning institution. The proposed framework contains six main phases which are *Creating Awareness*, *Identify Learner Needs*, *Identify System Requirements*, *Designing E-training Lessons roles*, *Development and Delivery of E-training*, and finally *E-training Program Assessment*. Furthermore, each phase includes some sub-steps as shown in Figure 3.

Figure- 3: E-training Adoption (ETA) Framework
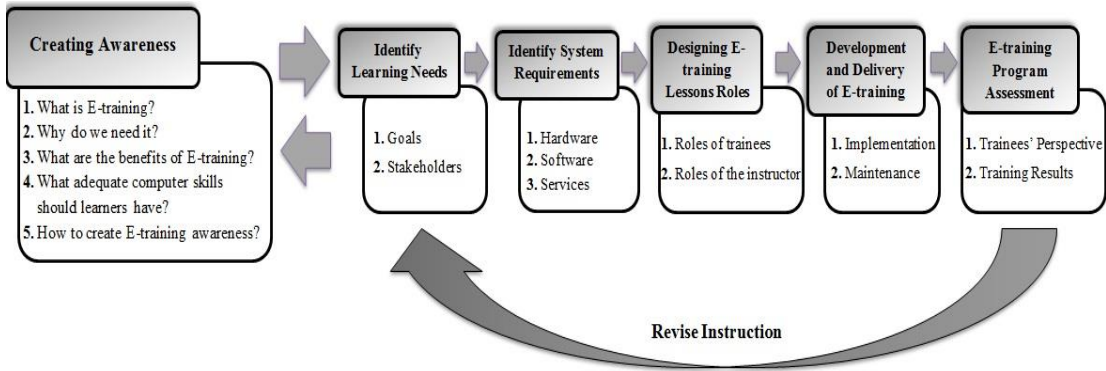
Creating Awareness

The first phase shows an early step of the proposed framework which is creating awareness about E-training. In this research, the awareness means to let the management team, academic employee, non-academic employee, students, and people know and understand the e-training approach. A set of questions are prepared in this phase; *i) What is e-training? ii) Why do we need e-training? iii) What are the benefits of e-training? iv) What adequate computer skills should learners have? v) How to create e-training awareness?*

Table- 6. Questions for Awareness

No	Questions	Description and expected benefit
1	What is e-training system?	This question is to guide the user to find out the meaning of e-training. The information can be accessed from various resources such as from the Internet, academic publications, vendors etc. This can help the user to understand and exposed to what e-training is all about.
2	Why do we need e-training system?	This question is to show the importance of e-training. Through this question, the e-training significance can be explained by assessing the organization needs. This includes by incorporating a multitude of assets, such as images and videos, to produce media-rich, flexible, interactive courses.
3	What are the benefits of e-training system?	This question is to let the users know what they can gain by implementing the e-training approach. For example: cost saving, flexibility, and meeting needs and expectations of trainees.
4	What adequate computer skills should learners have?	This question is to guide the user to determine what basic skills trainees/trainers should have to be able to use e-training approach. For example: trainees/trainers should have intermediates (e.g. computer or laptop), brewers or e-training software and internet skills.
5	How to create e-training awareness?	This question is to show the user how to create awareness about e-training approach. For example: the e-training awareness can be conducted by two methods which are *Advertisements* and *Seminars*.

Identify Learner Needs

This phase contains two steps which are *identifying training goals* and *stakeholders*. The training goals should describe how the gap in skill and knowledge are determined. The training goals must be clear of what learners will be able to do after completing the training program. The

same goals' statements can be reused during e-training program assessment to measure the success of the training session. Stakeholders mean the people who will be involved in the entire e-training program. They are *trainees* who need to be trained; an *instructor*, who provides a training session to the trainees; and a *developer* who is the responsible person for the e-training system.

Identify System Requirements

The primary goal of this phase is to create detailed system requirements and architecture to define the full set needed of e-training approach capabilities to be implemented. These system requirements include *hardware*, *software*, and *services*. Two options that user or organization should have: i) to build in-house e-training system or ii) to buy or renting the off-shelves software provided by established vendor such as ORACLE.

Designing E-training Lessons Roles

The fourth phase of the proposed framework is designing e-training lessons roles. Two aspects should be defined at this phase; *the role of the instructor* and *the role of trainees*. For example: the instructor's roles are responsible to provide training lessons, facilitate and conduct training sessions, conduct training assessment and communicating with trainees. For the trainees, their roles are to attend the training lessons and getting the materials as well as communicating with the instructor.

Development and Delivery of E-training

The fifth phase of the proposed framework is Development and Delivery of E-training. The development makes e-training presentation an ease understanding and usable structure. To perform this phase, it should be matched and straightforward with the previous phases, because this phase is a result of the previous phases. Building or developing e-training system depends on identifying learning lessons, identifying system requirements, and designing e-training lessons. The delivery here means using the Internet and an intranet to deliver e-training, because of e-training is built in Web environment. This phase includes two main stages which are *implementation* and *maintenance*. In the implementation stage, an e-training system is installed, initial users training are completed, and users' documentations are delivered to trainees. When this phase is completed, an e-training system is in steady-state of the training procedure, it is reviewed to ensure that the training procedure met all the goals for a satisfactory result.

E-training Program Assessment

The assessment focuses on continuous improvement. After the e-training program is completed, an assessment of this program will be conducted for accuracy, effectiveness, and clarity to meet the training goals. To assess an e-training program, two perspectives will be considered, *trainees' perspective* and *training result*. In the trainees' perspective step, trainees will be asked to evaluate a training program after it is completed. The evaluation will be on measuring how well trainees liked the training program. The next one is the training results. The training results will be measured based on predetermined criteria by the trainers.

Revision Cycle

To illustrate the revise instruction arrow in the Figure 3, once the e-training program has successfully conducted, it can be positioned at any components based on the trainers or trainees' needs.

6.1. Framework Validation

The validation process is performed as follow: the proposed framework was presented in front of two experts who are in charged and experienced in managing training programs. Five questions were used through this interview session to ask about the framework's structure, practicality and suitability for its implementation at a higher learning institution. Based on the interview the results were summarized as follow:

- The framework overall structure is sensible and suitable to be implemented at a higher learning institution.
- The framework is feasible, easy to understand and possible to be implemented.
- The framework gives a clear and effective way of presenting the general benchmarking concept.
- The framework provides comprehensive steps and covers most of the major aspects in e-training approach.

However, some improvements can also be done on the step's sequence and the activities involved in each of the phases.

7. CONCLUSION

In facilitating the training processes, there are some issues that can be overcome such as high cost (travel expenses), lack of flexibility, and others. However, having intermediate technology training such as e-training system can solve some of these issues. Therefore, in this research, an E-Training Adoption (ETA) framework was developed based on the understanding and analyzing of reviews and feedbacks gathered through literature review, survey, and interview. The ETA framework provides a step by step on how to develop awareness and readiness on for e-training adoption at a higher learning institution. UNITEN was chosen as a case study in this study for collecting requirements and to gauge the possibilities for e-training adoption. For future works, more data is still required to validate and improve the framework further that may include detail infrastructure design, policy and implementation plan.

REFERENCES

Ali, A. 2004. Issues & challenges in implementing e-learning in Malaysia. UNITEM Sdn. Bhd: (Cited on pages 4, 5, and 6.).

Asabere, N.Y. and S.E. Enguah, 2012. Use of information & communication technology (ict) in tertiary education in Ghana: A case study of electronic learning (e-learning). International Journal of Information and Communication Technology Research (IJICTR), 2(1): 62-68.

Bagnasco, A., M. Chirico, G. Parodi, and A. Scapolla, 2003. A model for an open and flexible etraining platform to encourage companies' learning culture and meet employees' learning needs. Educational Technology & Society, 6(1): 55-63.

Bernárdez, M. 2002. From e-training to e-performance: Using online learning to work.

Bowles, M. 2004. Relearning to e-learn: Strategies for electronic learning and knowledge. Melbourne University Publishing.

Chatzoglou, P.D., L. Sarigiannidis, E. Vraimaki, and A. Diamantidis, 2009. Investigating Greek employees' intention to use web-based training. Computers & Education, 53(3): 877-889.

Echard, R.D. and Z.L. Berge, 2008. Quality management builds solid e-training. Administering examinations for quality control in distance education: The National Open University of Nigeria Perspective EC IBARA, National Open University of Nigeria, NIGERIA . 7-11: 12.

Echard, R.D. and Z.L. Berge, 2008. Quality management builds solid e-training. Administering examinations for quality control ın distance education: The National Open University of Nigeria Perspective EC IBARA, National Open University of Nigeria, Nigeria. 7-11: 12.

Fallon, Carol, D.M. Jeanne , M.D. Jeanne, and B. Sharon, 2002. E-learning standards: A guide to purchasing, developing, and deploying standards-conformant e-learning: A primer for using the standards as decision support tools. . St Lucie Press.: (Cited on pages 3, 4, 5, 6, 7, 8, 9, 10, 15, 16, 17, 18, 20, 21, 22 and 25.).

Frank, d. and B. Rijkema, 2012. Positioning the oer business model for open education.

Hambrecht, W. 2001. E-learning: 2001 outlook for the learning management system market. IsoDynamic.

Hickman, J.S. and E.S. Geller, 2003. A safety self-management intervention for mining operations. Journal of Safety Research, 34(3): 299-308.

Horton, W.K. 2000. Designing web-based training: How to teach anyone anything anywhere anytime. Wiley.

Ion, R. 2007. E-education versus e-training life long learning perspective. ICVL.

Jarvis, P. 1999. International dictionary of adult and continuing education., London: Kogan Page.

Kamarudin, S.M. 2012. E-courses system. Universiti Tenaga National. pp: 28.

Khademi, M., H. Kabir, and M. Haghshenas, 2011. E-learning as a powerful tool for knowledge management. International Proceedings of Computer Science and Information Technology, 12: 35-39.

Khademi, M., H. Kabir, and M. Haghshenas, 2011. E-learning as a powerful tool for knowledge management. In: International Conference on Distance Learning and Education (ICDLE 2011). pp: 16-18.

Masie, E. and M.J. 2001. The e-learning revolution. McGraw-Hill. pp: 35-38.

McClelland, S.D. 2002. A training needs assessment for the united way of dunn county wisconsin. University of Wisconsin.

Naidu, S. 2006. E-learning: A guidebook of principles, procedures and practices, new Delhi: Commonwealth Educational Media Center for Asia.

Pagram, P. and J. Pagram, 2006. Issures in e-lerning: A thai case study. The Electronic Journal on Information System in Developing Countries.

Ramayah, T., N.H. Ahmad, and T.S. Hong, 2012. An assessment of e-training effectiveness in multinational companies in Malaysia. Educational Technology & Society, 15(2): 125-137.

Ramayah, T., N.H. Ahmed, and T.S. Hong, 2012. An assessment of e-training effectiveness in multinational companies in Malaysia. Educational Technology & Society. pp: 125-137.

Sloman, M. 2001. The e-learning revolution: From propositions to reality. CIPD Publishing.

Srinivasan, V.R. 2005. Design and development of web-based training system for education and e-portfolio. University of Oklahoma.

Suraya, H., N. Azizan, N.A. Yusof, M.T. Ijab, O. Leong, and H.J. Jean, 2008. The design and development of an open and flexible e-training system for the creation of learning organizations. Journal of Information Systems, Research & Practices, 1(12).

Suraya, H., N. Azizan, N.A. Yusof, M.T. Ijab, O. Leong, and H.J. Jean, 2008. The design and development of an open and flexible e-training system for the creation of learning organizations. Journal of Information Systems, Research & Practices, 1(12): 5-10.

Yu, H. and J. Fan, 2009. Design and implementation of the framework for adaptive e-learning system. In: Hybrid learning and education. Springer. pp: 140-149.