

A Conceptual of Interactive E-Learning Design: Based on the Digital Competence

Patthanan Bootchuy

The Academic Center for Educational Communications and Technology,
Office of Educational Technology, Sukhothai Thammathirat Open University, Thailand
patthanan.boo@stou.ac.th

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Abstract - This study aimed to examine the concept of interactive e-learning design based on digital competence for adult learning. The qualitative study was conducted by using content analysis related to the interactive e-learning design, adult learning and the digital competence were analysed and synthesized. The concept of interactive e-learning design based on the digital competence for adult learning can summarize in seven steps: 1) Identify essential experiences that are necessary for adult learners, 2) Select a grounded instructional strategy based on specified objectives, 3) Operationalize each event, 4) Define the type of interaction, 5) Select the interactive e-learning tools, 6) Readiness of digital competence and technical skills, and 7) Evaluations of learning outcomes in e-learning. This article presents the design and the direction of interactive e-learning in order to reflect and move forward on it.

Keywords - Interactive E-Learning Design; Digital Competence; Adult Learning

I. INTRODUCTION

New learning technologies and e-learning have given the opportunity to any individual with computer and internet access to study anywhere, anytime and to acquire new knowledge and skills. The success of online learning thus depends on the participation, engagement, and social interaction [1]. There has been a steady increase in the number of e-learning offered by universities. In the United States alone, more than 6.2 million

students took at least one online course in 2012. There is also an increase in the number of faculties teaching online, and they consider interaction to be crucial to the success of their online courses [2]. In contrast, key interactions that occur spontaneously in classroom settings must be carefully planned and sequenced as an integral part of e-learning.

Advances in technology also continue to increase access to e-learning opportunities, but do not necessarily improve the quality of the e-learning experience. There are now far more people designing online courses and course materials, with little to no formal preparation, practice, and experience in key areas such as, but not limited to instructional design and the quality of the online educational experience [3].

Digital competence can add to a successful life and effective lifelong learning of an adult learner in the knowledge society. In the new educational landscape, many learners enter further and higher education without the skills they need to apply digital technologies to education [4]. Extending and improving digital competence is an essential component in the development of employable graduates. This paper aims to create a conceptual for e-learning course designers, planned e-learning interactions to help university and guide research on e-learning interactions and the design of lifelong learning for adult learners.

II. RESEARCH OBJECTIVES

The aim of this research has examined the concept of interactive e-learning design based on digital competence for adult learning. The qualitative study was conducted by using content analysis of documents in the digital competence to get the new frontiers of learning. Documents and research papers related to the interactive e-learning design for adult learning were analysed and synthesized.

III. INSTRUCTIONAL DESIGN AND E-LEARNING

The value of e-learning wasn't about the technology, it was about designing for the technology and making e-learning to meet the need of learning goals. E-learning has various distinct advantages over other learning or conventional approaches like personality, flexibility, interoperability, collaboration, source sharing, reusability, cost and time effectiveness, and performance evaluation [5]. The instructional design of experiences delivered through e-learning reflects the instructional strategy or pedagogy and determines effectiveness. The institutions and organizations continue to increase the use of technology to deliver learning. But e-learning still has not realized its full potential. It's critically important to understand the courses that design, and delivery must be relevant to the learner [6].

The process of instructional design consists of the plan, develop, and evaluate instruction so that it is efficient, effective, and congruent with foundational learning theory. Staffordshire University [7] state that the model clarifies that e-learning is facilitated most effectively when it:

- is designed in timed chunks that emphasize time on task and expectations;
- is assessed using a range of types (self/peer/tutor) and options/choices;
- includes a variety of interactions between student/teachers/peers/external; and

- is accessible, activity-led, collaborative, and designed in phases that support, scaffold and increase learner independence.

The effective e-learning environments include: 1) opportunities for cultivating a sense of community and 2) diverse ways for students to interact with the content, the learning environment, each other, and the instructor for the purpose of meaningful learning. An important aspect to be considered in the design of e-learning programs is the evaluation of the instructional design, essential for the success or failure of centralized e-learning programs. According to Messaoudi, the evaluation of a new e-learning platform for distance teaching can be evaluated by satisfaction survey, the overall presentation of the platform, access to the platform, video quality, value of the videos for practical learning [8].

More specifically, scholars have indicated e-learning refers to an integration of pedagogy, content, technologies within a teaching and learning context and evaluations. Instructional design is a process used to plan learners be prepared for e-learning, develop the course content, the learning environment, technologies and evaluate instruction.

IV. PRINCIPLES IN ADULTS' LEARNING AND E-LEARNING

In higher education, adult learners are becoming more common in institutions. Adult learners often bring with experiences and expectations that can significantly affect their educational needs, progress and activity in the classroom. These learners are most often described as individuals identified as non-traditional: students over the age of 25 or who lie outside the traditional conception of a college student [9]. It has been suggested that adult learners need opportunities to harness the depth of their life experience to increase their abilities to perform critical thinking, a highly valued skill in higher education settings [10].

According to the studied of Manganello, adult learners should be structured in a way that: 1) allows learners to easily select, organize and

retrieve the resources they want, at their own pace and discretion; 2) streamlines the interaction process among learners; and 3) allows for trust and personal relationships among fellow students and the instructors [11]. Cox state that self-directed learning, as Knowles (1975) is a process where the individual takes the initiative over personal study process and results, can formulate learning goals, describe his learning needs and choose the best learning strategy [12]. Knowles's theory of andragogy involves several characteristics of adult learners, and these are:

1) Adults need to know. They need to know how the content is related to real-world problems.

2) Adults learn only when they are ready to learn and when they have a need to learn.

3) Adults have their life and work experience, that influences what they learn and can even hinder the learning of new thing.

4) Adults are self-directed as people grow older and mature, they become more self-directed in their learning.

5) Adults are internally motivated for the most part, though they can respond to external motivators as a bigger salary or new job offer.

6) Adults think about their learning as a life-centred activity, they are not interested to learn information which is not related to their life.

The difference between adult learners and traditional college students were adults have experience and are self-directed and independent, instructors need to consider the context of learning and understand that culture and society shape the adult learner and add to his or her individuality. Designing e-learning for adult learners should be structured in a way that: 1) allows learners to easily select, organize and retrieve the resources, 2) streamlines the interaction process among learners, and 3) allows for trust and personal relationships among fellow students and the

instructor.

V. INTERACTIVE E-LEARNING DESIGN FOR ADULT LEARNING

Effective interaction design has a high impact on the quality of an e-learning and on the learning outcomes. Interactive learning environments respond dynamically to learners' actions and are associated with active, learner-engaged processing of learning materials. Interactivity helps make e-learning courses highly engaging and productive for adult learners.

Interaction design is a process. Interaction has long been regarded as a vital factor in successful technology-mediated education. Hirumi purposed the three-level framework to design and sequence e-learning interactions consists of: level 1) Internal learner-self interactions; level 2) learner-human and learner-nonhuman interactions; and level 3) learner-instructional interactions [3]. E-Learning offers the potential for a wide range of active tasks, projects, simulations, and scenario.

Many educators have asserted that interactive tools help students to grasp and retain content easier. In addition, learners may interact with tools both within and outside of the online learning environment to facilitate learning. Centre for University teaching [13] proposed there are numbers of advantages for using technology tools in e-learning:

- More active learning.
- Diversified teaching ways.
- Better student attention and realization.
- Less time for lecturers.
- Visual stimulation.

However, there are four weaknesses in using technology when teaching courses:

- Equipment failures.
- The still need for backup plans and guidelines.
- Anxiety for lecturers.
- Time spent on learning new technologies and new skills.

According to Khamparia, the communication technologies, social networking, gaming and virtual learning act as a medium for e-learning. The reflecting of the students found that it has made the class more interesting so far [5]. During e-learning, students may serve as the primary means of interaction with both human and nonhuman resources for example: 1) Sent and receive e-mail, 2) Post message in wikis, 3) Blogs, and 4) Videoconference. There were empowered to communicate with their many classmates through e-learning tools [3]. In addition, there have a various digital education tools that can be support in interactive e-learning such as virtual reality, augmented reality, gamification, social networking, web applications etc.

In summary, there are three main forms of interactive e-learning design for adult learning: 1) learner - teacher interactions, 2) learner-learner interactions, and 3) learner-instructional interactions. These three kinds of interaction are supporting the achievement of learning outcomes in the e-learning environment. Furthermore, the technological tools are also powerful as they can bring a change and reform traditional forms of learning. By the way, learning with technologies also need guidelines and time spent on learning new technologies and new skills. It was also needed to consider the synonyms and the related concepts to cover the entity of digital competence because the technologies are in rapid change, and they also change the practices and the necessary competencies.

VI. DIGITAL COMPETENCE

In recent years, Digital competence is one of the key competencies for lifelong learning and become a key concept in discussions on the kind of skills and understanding learners need in the knowledge society. According to Ferrari, the digital competent today implies the ability to understand media, to search for information and be critical about what is retrieved and to be able to communicate with others using a variety of digital tools and applications (mobile, internet). This competence can be broadly defined as the confident, critical

and creative use of technologies to achieve the goals of learning [14]. Also, the definition proposed by Calvani, emphasizes the co-existence of dimensions that are characterized both on the technological, cognitive and ethical levels and by their integration [15].

The concept of digital competence is an emerging concept and related to the development of technology as well as the political aims and expectations for citizenship in a knowledge society. According to Ferrari, the digital competence areas that emerged from the frameworks presented in this report. All areas are here explained taking current examples from the analysed frameworks [14].

1) Information management refers to the knowledge, skills and attitudes needed to identify, locate, access, retrieve, store and organize information.

2) Collaboration refers to the KAS for linking with other users, participate in networks and online communities, and interact with others constructively and with a sense of responsibility.

3) Communication and Sharing refers to the KAS for communicating through online tools, considering privacy, safety and netiquette.

4) Creation of content and knowledge refers to the expression of creativity and the construction of new knowledge through technology and media, and to the integration and re-elaboration of previous knowledge and content and its dissemination through online means.

5) Ethics and responsibility refers to understood as the knowledge, attitudes and skills needed to behave in an ethical and responsible way, aware of legal frames.

6) Evaluation and Problem-solving refers to understood in more than one case study as the identification of the right technology and or media to solve the identified problem or to complete a task and also as the assessment of information retrieved or the media product consulted.

7) Technical operation refers to the KAS one needs for effective, efficient, safe and correct use of technology and media.

The negative attitude towards the course during / before the beginning of e-learning causes negative experience, resistance, and wasting of resources. The studied of Evija shown the results of the surveyed adults' digital competence is not satisfactory to independently study online. The adult learner would need special support for study online, for example, a preparatory course, special classes or lectures explaining the use of technological tools as well as practice. According to Piskurich, points out the necessity to think about the factors causing learners' engagement in e-learning activity and how could be prepared for e-learning. Calonie, state that readiness to learn may be a critical factor in understanding skill development and skills use disparities [16-18].

The summarizes the digital competence areas to prepared adult learner are as follows: 1) Information management, 2) Collaboration, 3) Communication and Sharing, 4) Creation of content and knowledge, 5) Ethics and responsibility, 6) Evaluation and Problem-solving, and 7) Technical operation. It is important to understand the necessity of readiness learners for e-learning based on digital competence, whether the individual has the necessary skills to be able to independently study in e-learning. It might become a problematic issue to most of the adult learner who lacks digital competence and technical skills. Developing adult learners' skills and knowledge about digital technologies requires trained learners, not only in skills but also in the methods and ways of learning.

VII. DISCUSSION AND CONCLUSIONS

Digital competence has become the key competencies for lifelong learning of an adult learner in the knowledge society. The process for designing e-learning interactions can summarize in seven steps: 1) Identify essential experiences that are necessary for adult learners, 2) Select a grounded instructional

strategy based on specified objectives, 3) Operationalize each event, 4) Define the type of interaction, 5) Select the interactive e-learning tools, 6) Readiness of digital competence and technical skills, and 7) Evaluations of learning outcomes in e-learning. That could be useful for e-learning course designers and facilitators to design of interactive e-learning to meet the need of learning goals.

In the context of design interactive e-learning, to the prepared adult learner in digital competence areas are very important. The digital competence areas can summarize as follows: 1) Information management, 2) Collaboration, 3) Communication and Sharing, 4) Creation of content and knowledge, 5) Ethics and responsibility, 6) Evaluation and Problem-solving, and 7) Technical operation.

E-Learning will continue to grow in importance for adult learners. There is also an increase in the number of faculties teaching online, and they consider interaction to be crucial to the success of their online courses. The key interactions that occur spontaneously in classroom settings must be carefully planned and sequenced as an integral part of e-learning. The challenge for educators is to learn how to provide a positive learning environment by using digital technology, through the new forms of learning engagement.

To be relevant and to create meaningful content, the designer must fully understand learner needs, readiness adult learners to learn with technology based on digital competence and then design courses and learning initiatives that address knowledge and performance needs and close skill gap. This requires intentionality, preparation, and an investment of time. Furthermore, to aspires, support and challenge future adult learners to come to learning with experience of technology and an expectation that will be an integral component of the learning experience.

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(Arranged in the order of citation in the same fashion as the case of Footnotes.)

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