Implementation of Online Instructional Technology and Hands-On Skills Training

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ABSTRACT

Online instructional technology supports an organization's capability in the online environment for training hands-on skills. This study uses the modeling theory by developing an online three-stage training environment of technical skills. This paper describes the implementation of the online environment for the course “making of a network cable”, and evaluates the effectiveness of the online method. A survey was used in comparing the online instruction with face-to-face teaching by using the following criteria: learning content's presentation; students’ attitude; students’ completion of the skills; the effectiveness of online learning; the organisational capability of online courses; the requirement of IT skills for online teachers. The results prove that effective teaching strategies can encourage the learners to practice technical skills in online courses.

Keywords: e-Learning, Hands-On Skills, Modeling Theory, Online Instructional Technology, Online Learning

INTRODUCTION

Online learning has been developed since the late 1990s (Mallon, Bersin, Howard, & O’Leonard, 2010) and has continued to make advances in developed countries. However, the application of online learning in Vietnam’s education system is substandard, and is only focused on sharing knowledge (Son, 2012). The instructional strategies for online courses in Vietnam have also been poorly designed for the teaching of technical skills (Ha, 2007; Anh, 2009; Binh, 2012; Van Hong, 2012; Thanh Hong, 2012). Therefore, the main purpose of this paper is to study the online instructional technology for the teaching and learning of technical skills.

TEACHING OF HANDS-ON SKILLS

The purpose of teaching hands-on skills is to help students gain knowledge of these skills as well as practice them. The methods of teaching hands-on skills involved students observing their teacher’s actions and then practising them by following the teacher’s instructions.
Hands-on skills can be achieved through certain process, which begins at the students’ level of perception and end with performing concrete action (Tuan, 2009; Khoi, 2013). This process consists of three phases of action; Forming motivation and perceiving necessary knowledge for action, analysing movement of action and performing the action.

The results of the first phase are the symbol and image of the action, in which students must understand the purpose, tasks and the principles of action. In order to help students achieve this outcome, the teacher should motivate and support the students with the necessary knowledge relating to the skills.

In the second phase, students will form their physical movement by observing and imitating the model performer. To support the learners, teachers need to lead by example and carefully explain the techniques on how to acquire the skills.

In the third phase, skills are formed gradually during the process of repeated physical movements. Therefore, in this phase teachers should provide sufficient opportunities for students to practice performing the three phases of action. The above three-phase process is the basis to design the lesson plans for hands-on technical skills instructions as well as to create an online environment for teaching technical skills.

**ONLINE INSTRUCTIONAL TECHNOLOGY**

Online learning (or online learning and teaching) is the instructional form that integrates Information and Communication Technology (ICT) applications to deliver lessons to learners via the Internet (Marc, 2001).

**Technology**

Technology is a system of means, methods and skills making use of objective laws to affect a definite object so that the obtained outcome meets the proposed demand of the society.

**Instructional Technology**

Instructional technology is a system of instructional means, methods and skills making use of psychological, sociological... objective laws to educate and train the learners so that they become definite personalities of the society (Lac, 2009).

Following the above definitions, this paper adapts the definition of online instructional technology as follows:

*Online instructional technology is a system of online instructional means, methods and skills making use of psychological, sociological,..., objective laws to educate and train online the learners so that they achieve the necessary qualifications (including working knowledge, skills and behaviour) in order to meet the employment needs of the society.*

Online learning is a technological approach (Lac, 2012) which consists of inputs (learners), objectives, lesson content, teaching technologies and performance evaluation. This process is always based on the criteria of feasibility (i.e. learning and teaching capabilities) and effectiveness (i.e. good learning and teaching) of designing, building and testing the learning process. The former is done using the relevant means (or media) and methods, and the latter is achieved by the skills of the individual who designs the lesson. Then, it is very important to use and create the teaching media in the online teaching process. The online teaching media presented in this paper is usually understood as a model to simulate the science and technical subjects (Giang, 2013). The methodology of simulation didactics and technology (Lac, 2013) is described as follow:

1. **Model:** A model basically means a physical or conceptual representation, from a definite viewpoint, of some typical attributes and relations of an arbitrary object (called
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Designing an E-Learning Curriculum
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