Chapter 10
Development of an Extended Information Quality Framework for E-Learning System Content for Engineering Education Courses (EECs)

Mohamed Alseddiqi
University of Huddersfield, UK

Rakesh Mishra
University of Huddersfield, UK

Taimoor Asim
University of Huddersfield, UK

ABSTRACT
Poor integration of pedagogical and technological learning elements within teaching and learning methodologies may have substantial impacts on the effectiveness of learning. Although educational institutions are improving their courses, teaching and learning methodologies and assessment strategies with tailored approaches, their efforts at improvement tend to focus narrowly on academic results. The authors believe that educational courses should give priority to educational goals and labour market expectations (industrial companies’ requirements) in devising the methodology of teaching and learning. The technology-based learning system has a capability to comply with diverse requirements as mentioned. The purpose of this paper is to develop an extended information quality framework to measure the effectiveness of e-learning content for technology-based learning systems for engineering education courses (EECs) in Technical and Vocational Education (TVE) in Bahrain. The model incorporates the requirements of educational goals (TVE goals) and modern industrial needs and integrates these with existing information quality frameworks. The extended model incorporates pedagogical and technological elements, is consistent with the educational objectives and industrial requirements, and can be used as guidelines for measuring the effectiveness of e-learning packages delivered in EECs.

DOI: 10.4018/978-1-4666-0936-5.ch010
1. INTRODUCTION

The authors have been researching the effectiveness of EECs in TVE system in Bahrain in meeting the requirements of educational and industrial stakeholders. A strength and weakness analysis of the existing provisions indicated that TVE in Bahrain is facing a number of operational challenges that are linked to the delivery of appropriate courses and training sessions and the development of appropriate skills required by modern industry (Alseddiqi et al., 2010). A work preparation skills model was proposed for improving knowledge, attitude, and technical proficiencies. The model provides a developmental structure to the content of EECs to meet modern industrial requirements and hence close/minimise the identified skills gap (Mishra et al., 2009). In parallel, TVE is employing information and communication technology (ICT) in teaching and learning processes. The aim is to convert the Bahraini society and economy into a technological society and knowledge-based economy. The rationale behind using technology in pedagogical practices is that it could be a feasible solution to meet the needs of industry as well as improving general education outcomes. Development of an effective e-learning package may contribute to close/minimise the identified work preparation skills gap. This paper describes the development of an extended information quality framework to ensure quality compliance. The model could be used to evaluate the effectiveness of e-learning systems in EECs. The next section of this paper presents educational and industrial needs requirements that an e-learning system must satisfy.

2. MODERN INDUSTRIAL NEEDS FROM TVE SYSTEMS

The importance of integrating industrial needs within the TVE has been extensively reported in the literature. Educators agree that the most important issue is to integrate appropriate skills in curricula development, including different knowledge, attitude, and practical skills. Brown (2002) indicated that students should learn how employability skills are practised in the real workplace and demonstrated across a variety of settings. In the learning process, employability skills were not an exception (Brown, 2002); students gain knowledge skills in the classroom environment and practise specific skills in practical workshops. It was worth mentioning that teachers have become master practitioners to help students in the learning process and adapt their teaching style according to students’ needs.

The Economic Development Board (EDB) and the TVE system in Bahrain conducted a benchmark study of the existing educational systems (TVE Directorate, 2006). The study found that significant demand existed for vocational skills in Bahrain’s labour market, which should be integrated effectively in the learning process. The study compared three educational systems in order to propose the one most suitable educational TVE for Bahrain, as shown in Figure 1.

Even though the existing educational system (dual) has its strengths and weaknesses, the study highlighted the important issues to be considered in a TVE system. Figure 2 shows the expected modern industrial needs from the existing TVE system and what the new system may offer to improve the standard of employability skills required by the industry to be integrated into EECs.

The QAAET report (2011) confirms the areas of main strengths and areas for development in the TVE system in Bahrain. The main strengths were in the following areas:

- Specific technical skills taught during vocational and practical modules.
- Health and safety procedures in the practical workshops.
Related Content

A Critical Perspective on the Challenges for Blended Learning and Teaching in Africa’s Higher Education
[www.igi-global.com/chapter/critical-perspective-challenges-blended-learning/68623?camid=4v1a](www.igi-global.com/chapter/critical-perspective-challenges-blended-learning/68623?camid=4v1a)

Design and Development of 3D Printed Teaching Aids for Architecture Education
[www.igi-global.com/article/design-and-development-of-3d-printed-teaching-aids-for-architecture-education/205564?camid=4v1a](www.igi-global.com/article/design-and-development-of-3d-printed-teaching-aids-for-architecture-education/205564?camid=4v1a)

Personal/Cloud Learning Environment, Semantic Web 3.0, and Ontologies
[www.igi-global.com/chapter/personalcloud-learning-environment-semantic-web-30-and-ontologies/133458?camid=4v1a](www.igi-global.com/chapter/personalcloud-learning-environment-semantic-web-30-and-ontologies/133458?camid=4v1a)

Mobile Technologies as Boundary Objects in the Hands of Student Teachers of Languages Inside and Outside the University