ABSTRACT

The most important aspects in e-learning are the employment of appropriate learning theory and paradigms, organisation of content based on sound pedagogy, as well as methods and techniques of delivery. For optimum characterisation and modeling of e-learning environment, the scope of this thesis is limited to this domain.

The assumption underlying this research is that current general and software-oriented e-learning approaches lack a comprehensive view regarding firstly, what learning theories should be considered, secondly, what are the most efficient teaching and learning principles that govern sound e-learning pedagogy, and thirdly, how do they accommodate multiple intelligences theory. The existence of e-learning frameworks that establish defined principles and best practices for effective teaching and learning which better support the e-learning process is a fundamental feature.

The central argument of this research is that, in order to develop a successful e-learning environment, a comprehensive view of the learning principles based on sound e-learning pedagogy and an instructional design process model has to be considered. This holistic view has to take into account the requirements as well as the constraints imposed by all parties involved (i.e. student, instructor and subject matter expert). In other words, the decision regarding instructional design and planning within any targeted e-learning environment has to take into account diversity of student’s learning styles, technical capabilities and organisational needs.
In regard to creating a pedagogically sound e-learning content, this research was concerned with proposing a conceptual framework for effective e-learning. The framework defines instructional principles and relevant instructional strategies as well as key elements for creating an effective e-learning environment. Moreover, the intelligences type and e-learning preferences of students in a Smart School environment were investigated. The purpose was to propose suitable features for e-learning based on multiple intelligences.

From the point of view of instructional design and planning, this research was concerned with proposing an instructional design process model that will assist in the development of learning modules based on accepted learning concepts while utilising the e-learning environment. This model ensures that courses developed for an e-learning environment have a flexible design approach and the capacity to accommodate several differing pedagogical approaches to cater for diversity of learning styles. The proposed model consists of a conceptual structure, procedural guidelines, and a list of required elements to include in the e-learning environment.

To test the effectiveness of this model, a prototype was developed. This prototype named SCEnE (Student-Centric E-learNing Environment) was reviewed by two different panels of educators. These panels report that the prototype does promote seven learning concepts as part of the e-learning environment. In a second means to validate the prototype, volunteer instructors were recruited to develop lessons using SCEnE and any other HTML authoring tool. The observations stated that SCEnE produces an average of 15% more learning content in the same development time as non-SCEnE. Furthermore, students stated that the prototype was easy to use and rated the usefulness of the activities provided in SCEnE based on their intelligence type.