Chapter 2
Personalized Ontology-Based Adaptive E-Learning System

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ABSTRACT

This chapter illustrates novel methods to provide personalized and adaptive content to the learners. This chapter illustrates a new methodology of automatically constructing concept maps using ontology to measure the learners' understanding for a particular topic, thereby teachers can adopt adaptive teaching based on the learners knowledge structures as reflected in the concept maps. The teachers can dynamically revise and deliver instructional materials according to the learners' current progress. In the approach, the authors provide dynamic content to the learners based on neuro fuzzy domain ontology extraction algorithm. This method also provides a personalized ontology model of a learner to learn the ontological user profiles from both world knowledge base and user local instance repositories. The main quality of the innovative work is to mine the personalized ontology of the learners to extract their knowledge through ontology mining using Inc Span+ algorithm.

1. INTRODUCTION

E-learning represents the employment of information technologies like the Internet, mobile and the parallel computer aided mechanisms in the teaching and learning procedure, either asynchronously or synchronously(Mohamed Jama Madar et al.,2014). The asynchronous E-learning is exclusively used for the content management mechanism where the users have the option of browsing the data during several

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occasions devoid of concurrent teamwork. E-learning or the pedagogy is mainly intended for the online users who team up concurrently. In both the cases, the content management system for E-learning functions as the treasure house for the learning materials gathered on the web. The E-learning pedagogy merely hands over the set of courses to the learners. In this regard set up the E-learning calls for diverse organizational requisites. However, in all cases, an organization which deserves to employ the E-learning has to guarantee that the system is appropriately put in place and effectively sustained thereafter.

The requirements of the university students have literally gone sky-high, with their varied needs and zooming aspirations for the E-learning based courses and the same holds good in respect of the requirements of proficiently functioning E-learning institutions. The prerequisites for the acceptance and utilization of the E-learning have to be revealed so as to promote the advancement of the system. It is highly essential to concurrently take into consideration several constraints such as the technological, pedagogical and individual factors for the proper execution of the E-learning measures. Nevertheless, the deficiency of the of hypothetical or/ and abstract structures for the effective performance of E-learning systems has paved the way for conflicting outcomes, leaving a basic question unanswered is on the essential attributes to have a positive impact on the efficient delivery of the E-learning (Mohamed Jama Madar and Oso Willis, 2014).

It is unfortunate that a number of institutions offering the higher education courses commit the mistake of putting in place vague E-learning mechanisms which often run counter to the declared mission and vision of the institution concerned in addition to being out of phase with the student needs. While admitting the imperative necessity for the E-learning system, and also accepting the undeniable fact that a host of universities have initiated instant and immediate measures to meet the requirements, it has to be painfully admitted the implementation of the systems concerned have been far from satisfactory, with the non-availability of the requisite infrastructure across a wide spectrum of the universities, and occasionally among diverse modules within the identical university. As on date, it appears there is the dearth of a standard strategic model for the implementation of the E-learning which broadly illustrates the common status and requisites of the institution concerned. In this regard, it is high time an appropriate model is effectively designed and put in place.

Personalization and adaptation of learning is generally considered as highly important, because learning has to be individualized to become more effective and efficient. This is particularly true for the situation in which learners enter the learning situation with different backgrounds and experiences, as in the case of workplace learning.

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