

AdaLearn: An Adaptive E-Learning Environment

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ABSTRACT

This paper describes the theoretical and technical aspects that were taken into consideration in the design process of a web-based adaptive e-learning environment we called (AdaLearn). AdaLearn system saves learner's responses into learner's profile then they will be used in future guidance. This paper presents an adaptation scenario in order to give recommendations about contents to individual learners taking into consideration learner's behavior.

General Terms

Elearning in semantic web.

Keywords

E-Learning, Adaptive learning, learning object, learning profile.

1. INTRODUCTION

The traditional learning approach was based on face-to-face learning, this form has evolved into other forms of learning such as distance learning and self-learning from off-line or online materials. Distance learning can take many shapes and it has evolved from distance learning (D-Learning) to electronic learning (E-Learning) and more recently to mobile learning (M-Learning). D-Learning is a form of teaching/learning in which the learners are separated by physical distance; time and/or resources. E-Learning is a learning approach based on the utilisation of technology, E-Learning as a concept covers wide set of applications ranging from computer-based desktop training to web-based learning [1].

E-Learning is an education paradigm that is based on electronic delivery of electronic learning materials over electronic media, including Internet, intranets, extranets, satellite broadcast, audio/video tape, interactive TV, and CD-ROM. The used electronic media are computing devices and the electronic materials are delivered using computer networks. E-Learning as a learning paradigm is also based on interaction with the learner [1]. One of the major goals of E-Learning is to allow learners to access learning materials and information ubiquitously from anywhere and at anytime. Therefore, learners have control of when they want to learn and from which location they want to learn. Also, all humans have the right to access learning materials

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ISWISA '10, June 14–16, 2010, Amman, Jordan.

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and information to improve their quality of life regardless of where they live, their status, and their culture.

When an E-Learning system to be delivered contains learning materials covering different levels of learning, the level of learner is taken into consideration to provide the learner with the learning materials that suit his/her level and his/her fields of interest. The concept is like running a level test of a student applying for a course and the level test is performed to decide the student's entry level. Adaptiveness is needed as some learning resources may not be in a format that is acceptable for different learners' needs and that fit the capabilities of different mobile devices, additionally content adaptation is needed to provide learners with appropriate courses view. To this end, E-Learning systems should employ some sort of adaptiveness.

Adaptiveness in the context of this work means that the same learning materials are represented differently to individual learners based on their interest which is determined based on their previous learning behavior.

There are two ways for the automatic use of course sequencing: adaptive courseware generation, and dynamic courseware generation. The idea of adaptive courseware generation is to generate a course suited to the needs of the learners. It can deliver adaptivity for small group of students, and it allows learners to communicate through the shared context and learn from each other. Also the static course that it generates can be delivered by a regular course management system [3]. While the goal of dynamic courseware generation is to generate a personalised (individualised) course taking into account a learning goal and the initial knowledge level of a learner. If the learner does not meet expectation, the course is dynamically re-planned.

In order to generate an individualised course, this course should take into consideration the learner's knowledge, goals, and timeframe, and to generate adaptive course, its difficulty and rate of progress should be considered [3].

E-Learning systems give alternative learning styles through the use of Learning Objects (LOs) such as examples, case studies, and procedural information, in order to provide personalised learning experience. These options give learners the flexibility to choose a suitable learning path instead of a rigid one.

Different LOs have different navigation alternatives, depending on their type, role, content and structure. For example, a learner starting a problem solving is recommended to go through all problem solving steps.

The proposed e-learning system (AdaLearn) in this paper responds to different learners differently by adapting the presentation of learning content to meet the varying needs and learning preferences of different individual learners. It enables learners to select their modular components to customise their learning environments and it enables them to get flexible solutions that dynamically adapt contents to fit individual learning needs.