Instructor Guided Personalization of Learning Path
Adopting SCORM

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Abstract. The growing interest in e-learning seems to be coming from several directions influencing traditional classroom to distant learning around the world. The advancements in web technologies motivated the personalized learning, pressurizing for a more personalized course for individuals. The driving components of a personalized course are the course structure and the learning content. This paper highlights the research carried out in designing a personalized course. Prior knowledge and learning styles are the two major parameters considered here for personalizing a course. Also the paper considers majorly on Sharable Content Object Reference Model (SCORM) conformance of the personalized courses, encouraging re-usability and interoperability of the courses across multiple learning systems. The main theme of the paper is to propose a system that guides an instructor to understand and provide personalized course path including learning content, activities etc. The proposed system reduces the time and burden of the instructor by considering the group of learners rather than individuals, achieved through clustering the groups based on their similar learning styles, which represents a traditional teaching model applied by the instructors.

Keywords: Personalization, Learning Style, Prior Knowledge Test, SCORM, Cluster

1 Introduction

Traditional learning is one of the fundamental modes of learning where students interact with teacher at one place, i.e. class room. The predetermined schedule of the class makes the traditional classroom based learning a hindrance to the students in gaining knowledge, for those who couldn’t attend. E-Learning can be viewed as a collimate solution for offering the same course in online mode for providing flexibility and motivation to the students.

Designing a course involves efforts and expertise, along with learning objectives and learners’ analysis to identify and foster the course content and material. Course design is interactive, not a linear process. A standard compliant course provides interoperability and reusability. SCORM [10] is one of the recognized standards for organizing the course. SCORM 2004 3rd edition is adopted as standard by ISO/IEC JTC1/SC36. In our proposed system we adopted the SCORM 2004 3rd edition, for

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making the course to standard compliance. This paper presents how an instructor organizes the personalized course by analyzing the learner’s preferences like prior knowledge and learning style [2]. Mapping of traditional classroom with e-Learning system poses the difficulty to provide the individualized courses. So clustering of students [1] with similar capabilities in terms of prior knowledge and learning style has been proposed.

2 Related Works

In the literature, different personalized learning systems have been proposed. Most of the systems exploited the approach of identifying the learning styles and the prior knowledge of the individual learner.

LECOMP5 framework [7] is a web base learning system for automating course personalization and adaptation based on dynamic student modeling, considering both the student’s knowledge and learning styles, which are updated based on the student navigation in the learning environment. The learning styles used in constructing the student model was identified using Felder-Soloman’s Index of Learning Styles (ILS) Questionnaire [9]. Diogene system [8] is an intelligent and adaptive platform that assembles learning material using both static and statistic knowledge to generate personalized courses. The static knowledge refers information concerning the available learning material, as well as relationships among concepts of specific domain based on ontology. The statistical information is being collected by continuous monitoring of the learner’s successes and failures obtained during the interactive test activities. The system has concretely adopted the Felder and Silverman pedagogical approach. Other systems like CS383 system [6] and the Intelligent Web Teacher system [5] proposed an adaptive presentation based on learning material typologies. The proposed system (Figure 1) is also based on capturing learning styles and prior knowledge of the learner’s in order to provide the personalization, but the existing systems discussed, builds the personalized course based on their own specifications. Our adaptation mechanism considers personalizing a course using standard constructs provided by SCORM, along with clustering the students based on similar learning styles identified by Felder-Silverman learning style model (FSLSM).

3 Approach

Personalization has many aspects but the base is important by which we provide the personalization. The services Learner Management, SCORM Conversion, Course Organizer, Semantic Query Handler (Figure 1) [3] work collaboratively to provide the personalized course. Learner Management service manage learning styles of all the learners by providing ILS questionnaire, during registration, to capture the learning style of learner in accordance to FSLSM. And instructors are also been chosen based on their knowledge profile.

R. M. Felder, 1998 described the four dimensions (Active-Reflective, Sensing-Intuitive, Visual-Verbal and Sequential-Global) of learning styles which can be
identified by answering a questionnaire [9], which helps the instructor while addressing the students with diverse learning styles. ILS is an on-line instrument used to assess preferences on four dimensions and categorize the learners based on their way of processing information. So now system has the learning style of all learners who has enrolled for the course [4] [9].

Instructor can design and manage SCORM compliant course by providing his/her course structure and content in form of folder hierarchy. Folders are treated as Module/Topic/Unit based on their hierarchical location, and htm/html files are treated as learning objects. Zipped version of the course structure is being taken as input by SCORM Conversion service to convert it into SCORM compliant course with basic sequencing attribute. Facility of creating fresh course compliant to SCORM has also been provided with the interactive user interface. The version of standard under consideration is SCORM 2004 3rd edition. Instructor decides the module dependency ratio inside the course, then designs a Prior Knowledge Test (PKT) based on it. It is important for learner that he should attempt the PKT before accessing the course [2]. Instructor categorizes the students into clusters based on similar learning style [1]. Instructor offers the course organized differently, to the learners based on their learning style and individual prior knowledge represented on the dashboard service. Instructor can arrange the sequence, append the activities, select specific content and remove the module from the course by inspecting the dash board for cluster or individual learner in Learning Path Editor service and generates the learning path template for cluster/individual learner. Type of content (Visual/verbal) and activities (Self-assessment, Assignment and Collaborative services) are decided on the basis of learner style. This personalized learning environment motivates and makes learners' interest to pursue the course in its entirety.

Figure 1: Proposed System for Personalized Course Management
4 Conclusions and Future work

This paper proposed that System provide the personalized SCORM compliant course under the guidance of instructor on the basis of learning style and prior knowledge of learner. We proposed system which focuses on mainly group of learners as cluster of same learning style properties because our concern to map the traditional learning into online learning environment and provide the standard compliant personalized course which can be used uniformly reuse in any LMS.

Future work is focused on tracking mechanism of SCORM compliant course as feedback system. When student access the course, the interaction and behavior with SCORM compliant course can be track. After certain time period instructor can reorganized the course for individual learner with the help of tracked data. Reorganization of course provides the remedial, problem based solution for the learner to understand the concept more in depth. This personalized course helps to learner to perceive the knowledge fast and efficient.

References