Chapter 7.11
Improvement of Self-Assessment Effectiveness by Activity Monitoring and Analysis

Dumitru Dan Burdescu
University of Craiova, Romania

Marian Cristian Mihăescu
University of Craiova, Romania

ABSTRACT

Self-assessment is one of the crucial activities within e-learning environments that provide learners with feedback regarding their level of accumulated knowledge. From this point of view, the authors think that guidance of learners in self-assessment activity must be an important goal of e-learning environment developers. The scope of the chapter is to present a recommender software system that runs along the e-learning platform. The recommender software system improves the effectiveness of self-assessment activities. The activities performed by learners represent the input data and the machine learning algorithms are used within the business logic of the recommender software system that runs along the e-learning platform. The output of the recommender software system is represented by advice given to learners in order to improve the effectiveness of self-assessment process. The methodology for obtaining improvement of self-assessment is based on embedding knowledge management into the business logic of the e-learning platform. Naive Bayes Classifier is used as machine learning algorithm for obtaining the resources (e.g., questions, chapters, and concepts) that need to be further accessed by learners. The analysis is accomplished for disciplines that are well structured according to a concept map. The input data set for the recommender software system is represented by student activities that are monitored within Tesys e-learning platform. This platform has been designed and implemented within Multimedia Applications Development Research Center at Software Engineering Department, University of Craiova. Monitoring student activities is accomplished through various techniques like creating log files or adding records into a table from a database. The logging facilities are embedded in the business logic of the e-learning platform. The e-learning platform is based on a software development framework that

DOI: 10.4018/978-1-61350-456-7.ch7.11

Copyright © 2012, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

uses only open source software. The software architecture of the e-learning platform is based on MVC (model-view-controller) model that ensures the independence between the model (represented by MySQL database), the controller (represented by the business logic of the platform implemented in Java) and the view (represented by WebMacro which is a 100% Java open-source template language).

INTRODUCTION

At international scale there is a tremendous preoccupation regarding e-Learning domain due to huge interest in e-Learning activities (Blackboard, WebCT, ATutor, Moodle, 2008). Generally, existing platforms have as main goal the efficient management of activities performed by all involved parties: management, secretaries, professors and learners. In this light, existing platforms implement for involved parties complex functionalities that provide a good activity flow. Any e-Learning may be regarded as a collaborating system that integrates specific implemented functionalities for involved parties. Regardless the collaborating system, for each of the four main actors there exist some common implemented functionality. In general, for secretaries there are implemented functionalities regarding the general setup of environment, like sections, professors, disciplines, students and other settings like year's structure. For professors there are implemented functionalities regarding the management of assigned disciplines. Students are the main beneficiaries of the environment. They may follow courses, communicate, self –assess and take final exams.

The Tesys e-Learning platform (Burdescu, Mihaescu, 2006) represents a collaborative environment in which all involved parties (e.g. secretaries, professors, students and administrators) accomplish their duties. The administrator, with the help of secretaries and professors are responsible for managing the environment in which the students will be through-out the e-Learning process. The platform has built in capability of monitoring and recording user's activity. The activity represents valuable data since it is the raw data for the machine learning and modeling process. The activity of each learner is seen as a sequence of sessions. A session starts when the student logs in and finishes when the student logs out. Under these circumstances, a sequence of actions makes up a session.

User's activity is monitored and recoded through a dedicated module implemented within the business logic of the platform. This facility was taken into consideration since the design phase of the platform. In was one of the requirements that the platform to be able to record user's performed actions with fine granularity.

The paper presents a recommender software system that selects the resource(s) that need further attention of learner. Guiding the learning may have important benefits regarding the improvement of self-assessment effectiveness. The scope of the recommender system is making the learner obtain the maximum knowledge from the self-assessment activity. This is accomplished by the classifier according with all previous learners's performed activity. The activity is represented by the number of answers to questions regarding that concept, the average result of answered questions and the final result at the discipline. Each filtered resource is to be recommended or not. There will be defined the values each feature may have.

Following the structure of the discipline (chapters, concepts, and concepts maps) the professor creates a set of quizzes that may be accessed by the learner. Self-assessment activity is represented by taking a certain number of on-line quizzes. The scope of the recommender system is to guide the student to the resource he/she needs to access in order to make learning progress to be an effective one. The objective measure of accumulated knowledge is obtained from self-assessment activity. We think that this activity must be coor-

18 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:
www.igi-global.com/chapter/improvement-self-assessment-effectiveness-activity/62544

Related Content

Wake Interaction Using Lattice Boltzmann Method
K. Karthik Selva Kumarand L. A. Kumaraswamidhas (2018). *Analysis and Applications of Lattice Boltzmann Simulations (pp. 223-261).*
www.irma-international.org/chapter/wake-interaction-using-lattice-boltzmann-method/203091

Sustainable Business Model Innovation: Using Polycentric and Creative Climate Change Governance
Job Taminiau, Joseph Nyangon, Ariella Shez Lewisand John Byrne (2020). *Disruptive Technology: Concepts, Methodologies, Tools, and Applications (pp. 2122-2141).*
www.irma-international.org/chapter/sustainable-business-model-innovation/231283

Factors Influencing the Adoption of ISO/IEC 29110 in Thai Government Projects: A Case Study
Veeraporn Siddooand Noppachai Wongsai (2021). *Research Anthology on Recent Trends, Tools, and Implications of Computer Programming (pp. 1340-1366).*
www.irma-international.org/chapter/factors-influencing-the-adoption-of-isoiec-29110-in-thai-government-projects/261081

Control of Information Stream for Group of UAVs in Conditions Lost Packages or Overloading
Dmytro Kucherov, Igor Ogirkoand Olga Ogirko (2019). *Cases on Modern Computer Systems in Aviation (pp. 128-146).*
www.irma-international.org/chapter/control-of-information-stream-for-group-of-uavs-in-conditions-lost-packages-or-overloading/222186

Optimization of the Angle of Twist of Propeller Using Modified Flower Pollination Algorithm
Kok Meng Ong, Pauline Ongand Chee Kiong Sia (2018). *Handbook of Research on Predictive Modeling and Optimization Methods in Science and Engineering (pp. 299-327).*
www.irma-international.org/chapter/optimization-of-the-angle-of-twist-of-propeller-using-modified-flower-pollination-algorithm/206755