Chapter 19
Interactive Learning in Virtual Communities: A Case Study for a Master Degree Program

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ABSTRACT

The aim of this chapter is to explore the behavior of the students enrolled in an online two-year master degree program in project management. One hundred twenty-nine enrolled students and more than 195 distinct characteristics/variables per student were analyzed. Due to the large number of variables, an exploratory data analysis through data mining was chosen, and a model-based discovery approach was designed and executed in Weka environment. Association rules, clustering, and classification were applied in order to identify behavior patterns and to discover the factors explaining the students’ behavior in virtual communities. Three actual behavior patterns were discovered for the first and second academic year. The students associated with the first behavior pattern tend especially to visit the administrative area of the e-learning platform, not being interested in communicating with colleagues and teachers. The students associated with the second pattern have a high interest for the administrative issues, but the teaching topics are not neglected either. The students tend to interact with their colleagues to a large degree, making proposals for new topics. Students presenting the last behavioral pattern are clearly focused on the academic activities and have a low interest for the administrative issues. Differences between the behavior in the first and second year are not relevant. The attribute with the biggest influence on the actual behavior in the first year is the volume of communication with the teacher, while for the second year it is the volume of materials for reading. The results of the data analysis are very encouraging and suggest several future developments.

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INTRODUCTION

The role of educational technologies in improving the learning outcomes was always controversial: according to some large-scale studies presented by Schacter (1999), there are both positive and negative findings related to the use of technology in educational processes. Among positive aspects, there are: students learn more in less time when using computers, students are more attracted to the classes where computer is necessary, teachers improve their practices, by replacing stand-up lecturing with an interactive approach of teaching. Among negative aspects, there are: computer didn’t have positive impact on every area; the level of educational technologies’ effectiveness depends on students’ population, educator’s role, level of student’s access to technology, software design. The current chapter embraces the idea of increasing the efficiency and effectiveness of educational technology through a thorough software design, based on a collaborative approach of building software requirements.

Educational technology is seen not only as a solution for improving traditional learning methods, but also a way of “reducing the inequities in educational opportunities around the world” (Amiel & Reeves, 2008). This aspect brings into discussion the reliability of educational software. The reliability issue is strongly connected to quality issues. Quality in educational software is critical, as a study developed by the European Quality Observatory has revealed (Ehlers, Goertz, Hildebrandt, & Pawlowski, 2005). The main quality characteristic is given by the degree of transformation made possible by an educational platform, meaning the increase in the degree of competence, as a result of the learning process: quality means obtaining “the best learning achievement.”

Numerous studies about the impact of computer technologies on students’ perceptions and behavior have been conducted and based on these, several theoretical frameworks were developed. The student behavior in the e-learning environment represents an important topic in e-learning research being strongly associated with the student’s academic performance.

The UTAUT model defined by Venkatesh, Morris, Davis, and Davis (2003) synthesizes different studies on technology and human behavior. There is an important literature on technology acceptance and its application in planning and implementing the new technologies in distance learning programs (Robinson, 2006). The UTAUT model explains the students’ behavior in connection with the acceptance and use of e-learning platforms. The model integrates categories and variables that influence the behavioral intention of technology adoption and use. The categories considered as direct determinants of user acceptance and usage behavior are the following: performance expectancy, effort expectancy, social influence and facilitating conditions. The performance expectancy represents the degree to which an individual believes that using the technology will help him/her in performance gains. The effort expectancy is the level of simplicity associated with the use of the system. The social influence is defined as the extent in which an individual perceives that important others believe that he/she should use the system. And finally, the facilitating conditions reflect the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system. This model includes the following four moderator variables: age, gender, prior experience and voluntariness of the technology use. The UTAUT model was already used to discover the factors influencing teachers’ acceptance of information and communication technology (ICT) in the classroom (Birch & Ervine, 2009), to investigate the determinants of mobile Internet acceptance and to find out the extent to which students used and accepted M-Learning as an education delivery method (Williams, 2009).

Considering the high diversity of the student’s activities in virtual environments and the numer-
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