

## Chapter 3

# A Three-Dimensional Environment of Personalized Recommendation of Learning Objects to Support Ubiquitous Learning

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### ABSTRACT

*The advancement of technological resources has provided new possibilities in teaching and learning processes. This progress resulted in an improvement to the Distance Education (DE). However, this type of education still faces the serious problem of circumvention having as a major cause, lack of motivation among students. Thus, the use of new technological trends has been increasingly common with the purpose to provide greater attractiveness for student participation in distance learning courses. Thus, this study aims to propose a multiagent virtual environment in three dimensions to support the recommendation of learning objects in order to improve the teaching and learning processes in DE.*

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## INTRODUCTION

The technology has been a great ally of Distance Education (DE), given that many teaching resources currently used by teachers and students are digital tools with high level of interaction that help in productive and qualitative way in educational processes and learning. Currently, there are several of these attractive features, highlighting the Learning Objects (LO). According to Laverde, Cifuentes and Rodriguez (2007), LOs as a digital self-contained and reusable entity, with a clear educational purpose, with at least three internal and editable components: content, learning activities and elements of context.

It possible to also mention, as references in technological advances the mobile devices and wireless communication, as these also contribute considerably to the teaching and learning processes. In this context arises another term, known as Mobile Learning (ML - Mobile Learning), which is the integration of these technologies to improve the learning process (Sacco et al., 2010).

The typical problems of DE, such as lack of motivation of students, resulting often in the abandonment of the courses currently stimulate studies on the use of new technologies (Yessad, 2010). The great advantage of integrating different technologies, so that they interact with each other to assist in the teaching and learning processes, is that all users can enjoy various beneficial aspects of this new approach, where we highlight the convenience of providing materials, access them and view them at any time and place (Yau & Joy 2011).

Currently, there is a difficulty in getting the attention of young people to activities aimed at learning. Specifically in DE mode, this is considered a challenge in this decade. This is because young people have a wide range of information resources, very interactive, which are available at your fingertips at all times. This has disrupted the performance in study activities at a distance, due to excessive use of these resources. One example is the information and communication technologies (ICT), which have a lot of entertainment, retaining thus the attention of these students.

According to Oliveira and Tedesco (2010), another problem is related to virtual learning environments available in the market which, although they are plenty, yet continue to treat all its similarly users. Consequently, there is often no incentive for building and effective sharing of knowledge, which also generates motivation problems and low income in studies. Therefore, it is necessary to create mechanisms that provide, to the environments, autonomy to relate to the learning content according to the context of students and then to recommend these, based on the characteristics of each student.

In an attempt to improve these environments, emerges the concept of context-aware environments. Consist of environments that suit the user's profile, considering information provided by the user as well as the captured dynamically from a given scenario that can rely on the interaction between this user and computing devices (Moore, Jackson and Hu 2010).

Given this view, this paper proposes the UniVirtual (Virtual University in the English language), an virtual learning environment system integrated with the Moodle, which allows you to simulate a 3D virtual university in web browsers or natively on Android systems. In this environment you can go with a character student, a virtual university which contains some NPCs (Non-Playable Characters) controlled by agents in order to assist in the teaching and learning through the recommendation of LOs. On the mobile device it is still possible to capture real user location that could influence the accuracy of the recommendation contents.

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