Chapter 33

Geo@NET in the context of the Platform of Assisted Learning from Aveiro University, Portugal

Elisabete Peixoto
University of Aveiro, Campus Universitário de Santiago, Portugal

Estela Martins
University of Aveiro, Campus Universitário de Santiago, Portugal

António Batel Anjo
University of Aveiro, Campus Universitário de Santiago, Portugal

Alexandre Silva
University of Aveiro, Campus Universitário de Santiago, Portugal

ABSTRACT

Geo@NET is a computer game, played online, whose main purpose is to motivate students to the study of Geosciences. This is the most recent game included in the Platform of Assisted Learning of "Projecto Matemática Ensino" (PmatE), and the first geosciences online game that was developed in Portugal. Geo@NET project involves the conception, planning, and development of several Question Generator Models, for online games and competitions between students of the 3rd cycle of Portuguese Basic Instruction. The main challenge of the game is to find the correct answers (true/false) in a set of affirmations. Only solving the questions of each level of the game allows the player to go to the next level. Since 2009, the number of games played in geo@NET has increased, which encourages for further developments of this project. Thus, this chapter aims to describe QGMs, the development of the game, and the results obtained so far.

INTRODUCTION

The majority of people consider that playing games is a funny activity, in opposition to learning, a "boring" activity. Moreover, the "thrill of victory and agony of defeat" is experienced repeatedly throughout playing games, maybe because the immediate mental stimulation that the game player experiences can be exhilarating (Moursund, 2006). So, the fun and mental stimulation of games can be used as an important component for formal and informal education. Educational games are seen as technologies that have an application

beyond entertainment (Stapleton, 2004) and are a good example of activities that can be used as a learning device to complement other teaching methods (Alexandre & Diogo, 1990; Moursund, 2006; Peixoto & Martins, 2010b; Peixoto *et al.*, 2009). "*Gaming in the science classroom has the potential to deeply engage students*" (Annetta *et al.*, 2006, p. 21). Educational games can act as an extension of the classroom, helping students that don't succeed with conventional teaching methods. When students are playing, their goal is to win the game, which is a very motivating factor. On the other hand, these games involve the player in the task, contributing to increased creativity and critical thinking (Gredler, 2004).

Geosciences is an area of utmost importance in our lives, namely in protection of the environment, in prevention of geological hazards and even in medicine. However, there is a general lack of interest for the study of this scientific area (Carneiro *et al.*, 2004). This is due to the fact that citizens don't know what geologists do (Brilha, 2004) and they don't know and/or understand the geologists' contributions to solve society's problems (Andrade, 2001).

School results have also shown that traditional teaching methods have not been able to motivate students to the study of Geosciences. Therefore, it is necessary to "*innovate, creating new teaching methods, that put students in the centre of the learning process, and where teachers are mediators*" (Anjo, 2006, p. 56).

One of the factors that can contribute to the renewal of Geosciences Education is the use of diversified resources (Marques *et al.*, 2001). In this way, to increase the interest for the study of Geosciences, to demonstrate its importance in society and to promote scientific literacy, it's possible to use non-formal teaching methods, such as Internet and computer games (Peixoto & Martins, 2010a; Peixoto & Martins, *in press*; Peixoto *et al.*, 2008).

Once computer games are so popular among young people it's important to use them in a scientific area that, at least in Portugal, has scarce resources. geo@NET seeks to contribute to change this situation and to increase the number of educational games for this scientific area. Besides that, it intends to create an attractive environment to the study of Earth Sciences . To realize if this type of game can indeed enhance students' motivation to the study of Geosciences and, at the same time, to evaluate the use of PEA by students and teachers, geo@NET is now the subject of a PhD thesis.

This chapter aims to describe the origin and development of PmatE, referencing the competitions that, each year, are organized at the University of Aveiro. More specifically, it describes question generator models and, particularly, their application on geo@NET, bearing in mind the results obtained so far. Finally a few proposals for future work are presented, along the possibility of the development of a new type of games, considering all that has already been achieved.

GAMES AND COMPETITIONS OF "*PROJECTO MATEMÁTICA ENSINO*" (PmatE)

"P*rojecto Matemática Ensino*" (PmatE) was created in 1989, by the Department of Mathematics of the University of Aveiro. Considering the weak results in Mathematics, PmatE introduced new methods for the study of this scientific area, namely online games and competitions for all degrees of education.

The main purpose of PmatE was to create and/or to increase the interest for Mathematics, through the promotion of computer literacy and study habits (Miranda *et al.*, 2007). Initially intended only to Mathematics, this project has been recently extended to other scientific areas, including Geosciences (Peixoto, 2009).

Related Content

Success Factors for Games in Business and Project Management
(2018). *Enhancing Education and Training Initiatives Through Serious Games (pp. 34-68).*
www.irma-international.org/chapter/success-factors-for-games-in-business-and-project-management/189663

A Rationale for Leveraging Serious Game Design Through Sociocultural Theory
Ilias Karasavvidis (2022). *Handbook of Research on Promoting Economic and Social Development Through Serious Games (pp. 288-310).*
www.irma-international.org/chapter/a-rationale-for-leveraging-serious-game-design-through-sociocultural-theory/300633

Anxiety of the Avatar: Relation of Character Design to Reception in Transmediatic Games
Tülin Sepetci, Tülin Candemirand Tülay Candemir (2023). *Research Anthology on Game Design, Development, Usage, and Social Impact (pp. 1581-1620).*
www.irma-international.org/chapter/anxiety-of-the-avatar/315557

Experiences in Usability Evaluation of Educational Programming Tools
J. Ángel Velázquez-Iturbide, Antonio Pérez-Carrascoand Ouafae Debdi (2013). *Student Usability in Educational Software and Games: Improving Experiences (pp. 241-260).*
www.irma-international.org/chapter/experiences-usability-evaluation-educational-programming/70249

Experiencing Presence in a Gaming Activity Improves Mood After a Negative Mood Induction
Stefan Weber, Fred W. Mastand David Weibel (2020). *International Journal of Gaming and Computer-Mediated Simulations (pp. 1-22).*
www.irma-international.org/article/experiencing-presence-in-a-gaming-activity-improves-mood-after-a-negative-mood-induction/268880