



## Game Based Learning for Teachers

**Anisoara Dumitrache**

University of Bucharest (Romania)

[anisoara.dumitrache@credis.ro](mailto:anisoara.dumitrache@credis.ro)

### Abstract

*Game based learning (GBL) is a term frequently used in the last decade, without having a precise definition, but with serious preoccupation on its influence in increasing students' interest on learning, enhancing learning experiences and on the potential of digital games as learning tools. Computer games are ideal medium to promote authentic learning and "learning by doing" [3] and turning the student into the leader of his / her own learning experience. Having this meaning, digital games can provide meaningful learning experiences by simulating highly interactive scenarios that professionals encounter in real-world settings, where they face open-ended, real-world problems (James Paul Gee, 2003; Mitchell et al., 2004).*

*Nowadays, young people and not only are used to play games. The commercial games market has significantly increased and the offer is very large. Most of the games are very complex, organized on levels, with a rewarding system, laborious actions or activities wrapped up in a challenging story, with well defined rules and with a high quality interface. Despite the preoccupations for the aspects presented previously, these games are developed to entertain players without transmitting any educational message.*

*In this way, a serious gap appears when teachers interested in introducing games in lessons try to fit some of these in current curricula [6]. On other side, the number of authoring tools which offers the opportunity to create their own game is limited. The ProActive [6] project offered the opportunity to adopt this new pedagogical approach – game based, through two game editors free to be used in educational settings. University of Bucharest as partner in this project was actively involved in project's activities in implementing the games based learning approach in three pilot sites, and active support for educators involved in the process of game creation, and later, in implementing these games in classes.*

*Later, continuing the project's vision, we used project's findings on students enrolled in a master programme called "ICT in education". Students enrolled in this master programme are, in real life teachers of different disciplines interested in introducing new technologies in learning. During a semester these students were trained to use a game editor, and working in teams they created their own educational games.*

*The aim of this paper is to present the process of game creation and the results obtained by this students which have become "game designers".*

### 1. Introduction

There are many theories about computer educational games in general and about Game Based Learning in particular. Some of these theories affirm that video games facilitate learning [4]. The game design process has been described as a powerful learning environment according to attributes identified by Smeets (2005) in recent studies on children, as it promotes effective learning and learner autonomy (Robertson, J. and Howells, C., 2008). In fact game design is considered a rich task that offers opportunities to exercise a wide spectrum of skills to embody creative ideas in a complex, cultural artifact that can be enjoyed in other contexts both from peers and from an audience (Robertson, J. and Howells, C., 2008).

The ProActive project (ProActive - Fostering Teachers' Creativity through Game-Based Learning, is a European project (Lifelong Learning Programme KA3), Project number: 505469-LLP-1-2009-1-ES-KA3-KA3MP) contributed to the promotion of educational games and enriched the Game Based Learning knowledge through studies conducted. Also, during the project, many valuable games have been created by educational practitioners, transforming teachers in game creators and fostering creativity. This project brought two game editors, free to be used by anyone interested computer educational games. The results of the project are available at: [www.proactive-project.eu](http://www.proactive-project.eu).

Using the project's resources (game editors and training provided to use game editors, studies from the field) and based on the successfully games created and implemented in real learning contexts, University of Bucharest has decided to multiply the project's results and train the students from a master programme (ICT in education) to become game designers.



In this sense, during a semester, students were trained to use one of the game editor, and to integrate this game sequence into a lesson.

## Case study

### Presentation of the case study

Students from “ICT in education” master programme were involved in this experiment about Game Based Learning. These students are, in their real life, teachers of different disciplines in secondary or high schools. Their teacher status is compulsory to be able attending this master programme. They enrolled here willing to learn how to integrate computers in their classes and lessons, to innovate and to increase the interactivity and the interest for their discipline. In their first year of study, they get thoroughly into ICT literacy, and, in second year the disciplines were related to the effective use of computer in lessons. In such course, Computer Aided Instruction, we introduced during laboratories (which are organized as practical activities) the study of Game Based Learning.

Around 40 students participated in this course during a semester (14 weeks), studying the problem of Game Based Learning, acquiring technical support in using the game editor, and learning to work in teams, through cooperation, they created their first own game. At the end of the course, not all students created the games, some of them have abandoned this idea and for final exam, they prepared other tasks.

### Game editor

<e-Adventure> is an educational game authoring tool [7]. It allows for creating 2D educational computer games and simulations. The tool was designed to reduce the development cost of educational games, facilitate their integration with e-Learning platforms (e.g. Learning Management Systems such as Moodle™) and involve instructors in the development process. <e-Adventure> is developed by the <e-UCM> e-learning research group at Universidad Complutense de Madrid.

### Course organization

This course had two main objectives:

- To develop students' creativity in using the resources available through ProActive Project [5]
- To create educational computer games this will be further implemented in real educational settings.

The students were separated in two separate groups, and in the first phase they were working individually on computers. First lessons introduced students Computer Aided Instruction (CAI) and Game Based Learning (GBL) theories and research, examples of lessons with CAI sequences, examples of educational games, idea of implementation, best practices, and guidelines. The students were asked about the use of computer in their schools and classes with argumentation. The answers revealed two aspects: school attitude for implementing ICT and teachers' attitude on new technologies, and can be summarized as follow:

- The lack of technical support in schools
- The lack of training for teachers
- The lack of commercial educational resources such as: educational software, games, interactive lessons, different application (encyclopaedias, movies)
- Difficulties in finding appropriate resources
- Time constrains to prepare the educational resources.

Some answers expressed worries about children and their physical and emotional health.

In a second phase, students started to effectively work with the game editor, during the laboratories, and as homework, they had to search for different resources to be included in the game.

### During the course

The process of game creation with the students was challenging on both sides, the course needed adjustments and new approaches; students have experienced a series of emotion, starting with excitement, enthusiasm, also frustration and finishing with the satisfaction of a well done job.

The training sessions were developed around needs of the participants, to acquire the necessary knowledge and skills in order to be able, after the training, to design their own educational game. The training sessions were designed to explore the participants' impressions, learning experiences, ways to use and develop creativity, but also technical training for using the game editor.



During the process of game design, several aspects must be underlined, being observed as important success factors. For the final exam, students had the opportunity to choose between creating game and planning a lesson with the help of computer.

One of the most important issues of the entire course was to keep students *motivated*. As previously said they could choose the subject for final examination, and maybe the temptation was to choose the easy way. The motivation was mostly intrinsic, giving the fact that no reward (except the grade for the course) was promised or given. Students who decided to create one game declared that they were guided by curiosity, need of improving the teaching skills, desire to continue the work and to include it in their master thesis. It was observed a high level of motivation in groups, where members could cooperate, split and share the tasks.

Some of the students give up training, even if their first option was to create games. This was caused by the *technical demands* required in order to finish the game. Here, frustration of not being able to work with all the menus and tools of the game editor, and also other technical difficulties (computer configuration, supplementary work for searching the resources needed to be included in the game editor, etc.) have determined some students to abandon this project. We must underline the fact that the dropout rate was increased in the case of students which were not included in a work group.

During and after the training session students had to deal with the *expectation* on the game editor. Once they start to effectively work with the game editor some of initial idea about the game had to be reconsidered and to adapt the game on game editor's affordances. The students were aware about the fact that nowadays most of the children are very good game players and they will be very demanding with the graphical interface, with the characters, story and challenges from the game. We had to convince them about the fact that the commercial games on the market offers a rich experience in the field of games and technology used but with serious gaps in educational message.

Most of the students needed technical guidance during the process, but also it was continuously necessary to remind them about the *final scope* of this action. There were several moments in which teams / students were not aware about the time constrains and they were not clear with the final scope of the course (e.g. creating a game). For some of the students the moment of ending the course represented a start for a future work (further development of the game and implementation in real learning contexts in parallel with including all the results in a master thesis).

From the beginning of the activity the students had the benefit of a *continuous support*, during face to face meetings, online meetings and through email. Still, a very small percent of students accepted to work outside the classroom, and to do supplementary work.

*Working in teams*, they were encouraged to plan interdisciplinary games, with content which can be easily adapted to different disciplines, offering to all members of the group same opportunity in using the game.

## Results

Coming back to the course's objectives, we may state that these were accomplished, in different percentages.

- A series of educational games were created (working in teams of maximum 5 students) – 8 playable games covering different disciplines from current curricula of primary and secondary school.
- Games are related to: literature (storytelling, vocabulary), sciences (starting from simple mathematic calculation and going to the general knowledge combining, for example, questions about the Egyptian pyramids and their geometrical shape and definition from Geometry to the questions about Egyptian culture).
- All the students have participated in this course, regardless the option for final examination.
- About three quarter of students (29) created games.
- 11 students choose the other subject for the final exam (only 5 students decided from the beginning, 6 students had to reconsider their initial position, abandoning the game design process).
- Students' creativity, going further to the students' statements, and initial excitement determined by the result (game) could be demonstrated in the future activities, through the way they use games in classes or in adapting other games in their discipline / activity, in creating new games using available resources.

## Conclusions

The idea of introducing this approach in curricula was determined first by the previous preoccupation on the field, for innovation, to create a motivated environment in which students were able to show



and improve creativity. More, these students will take forward the results implementing them in real contexts, and in any moment can edit the current game or they can start a new one. The game editor is available and free to use.

This action (course) was meant to show the students other teaching approaches in traditional classes, and appropriate educational resources to be used. Regardless the background and their technical skills, through this course and working together, the students were part of a small community, sharing the same interest for innovative teaching approaches in general and GBL in particular.

During the course, most of the initial ideas were abandoned, other strategies were found, the games were adjusted permanently, were simplified as an adaptation to the game editor features, were tested and re-tested.

The results obtained through this experiment (8 playable games and a rich experience) confirmed the assumption that GBL is an actual subject, educators are interested in using this approach, and team work is a viable solution to overcome the fear of unknown.

### References

- [1] W. Hurton Designing Web-based training (John Wiley & Sons, Inc., 2000)
- [2] M. Logofatu, Computer aided instruction (Ministry of Education and Research, Project for Rural Education 2008)
- [3] T.W. Malone & M. Lepper, Intrinsic Motivation and Instructional Effectiveness in Computer-Based Education. In Snow & Farr (Eds.), Aptitude learning and instruction. (London: Lawrence Erlbaum Associated Publishers, 1987)
- [4] M. Prensky, Digital game based learning, New York, NY: Free Press, 2003
- [5] Research conducted during ProActive: Fostering Teachers' Creativity through Game-Based Learning, is a European project (Lifelong Learning Programme KA3), Project number: 505469-LLP-1-2009-1-ES-KA3-KA3MP
- [6] [www.proactive-project.eu](http://www.proactive-project.eu)
- [7] <http://e-adventure.e-ucm.es/>