GBL AND CREATIVITY IN CLASSES

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Abstract: *The aim of this paper is to present the results obtained during ProActive project, a European project having as main objective the creation of learning contexts in which educators (teachers, professors, trainers) of different LLP sub-programmes (Comenius, Leonardo da Vinci and Erasmus) can an apply their creativity in designing their own GBL scenarios using digital tools (two games editors: Eutopia and <e-Adventure>). In order to identify project's potential in developing educational games, in the first phase of the project were organized several focus groups with teachers, trainers and professors according to an initial project plan. The results obtained helped the team to adapt the two game editors according to the users' needs. In a second phase, University of Bucharest has selected three pilot sites representing centers, associations, institutions that offer courses in different fields: from computer skills and advanced computer networks to personal development and outdoor education were selected to be part of implementation phase. The selection process was made according with specific criteria related to their experience in the field and institutions' interests to use Game Based Learning in their current practice. Through co-design sessions and workshops participants learned how to use the tools for creating games, and how to integrate these computer aided instruction sequences in a regular classroom. Through Game Based Learning, trainers will improve their teaching methods, transforming classes in spaces for collaborative work, participation, problem solving. Game Based Learning will encourage students to continue their work at home and to communicate with other colleagues and trainer even if the learning scenarios are applied in traditional learning, in blended learning, or in distance learning.*

Keywords: *creativity, LLP sub-programmes, GBL, co-design.*

I. INTRODUCTION

ProActive[1] is a two years EU project focusing on games in education and training, choosing a new approach – game design, and with a special focus on the five learning metaphors: Acquisition, Participation, Discovery, Imitation, and Experimentation. The main scope of the project is to foster creativity in classes, by using Game Based Learning. Educators from different sectors and educational levels (trainers, teachers) were engaged in this process having the opportunity to become game designers, creating their own games according with their teaching practices and students. Traditionally, teachers and trainers used in their practice one sole dominant learning paradigm (i.e. instructional or participative), thus limiting their creative potential.

Recent studies instead show that in natural situations learners combine simultaneously five metaphors for learning: Imitation, Participation, Acquisition, Exercising, and Discovery. Also, game-based learning (GBL) supports creativity and inquiry-based learning processes. ProActive claims that if it is true that we teach how we were taught we can claim that we also learn as we were taught.

ProActive creates learning contexts where teachers of Comenius, Erasmus and Leonardo sub-programmes can apply creativity in designing their own GBL scenarios using digital tools. EUTOPIA[2] and <e-Adventure>[3], two game editors have been adapted to respond to new requirements and learning contexts.

This paper will present the activities carried out by University of Bucharest to foster creativity through Game Based Learning (GBL): user needs' analysis, training sessions, design process and implementation in real learning contexts. A special focus on the process of game design in the light of creativity: to what extent the trainers were in a creative state along the process.

II. PROJECT ACTIVITIES

Introducing game based learning model in formal education was a difficult even hard process because of different constrains related to the resources, school infrastructures, conceptions. Professional training is also affected on these constrains even if nowadays GBL catches the educators' attention and is seen as a creative teaching approach, with the existing studies showing a clear relation between playing digital games and learning and opinions favourable to digital games as learning tools.

Game Based Learning has been widely adopted for children's learning. Pedagogically highly valued products are on the market and have a proven success in the improvement of learning as well as in children's acceptance. Recently, Game Based Learning has also been proposed for adult education.

Gaming is becoming a new form of interactive content, worthy of exploration for learning purposes. On the specialized market, the offer of commercial-off-the-shelf games is wide, but there were identified important barriers in implementation of Game Based Learning in formal learning settings. These games are complex, challenging, offer short feedback cycles but are also a source of inaccuracies, errors and misconceptions from educational perspective, difficult to integrate them in current curriculum and often are not meet educational standards or educators' expectations.

Indeed, valuable educational games could be created by teachers, with clear benefits that come from using these custom games with direct relevance to their teaching objectives instead of using commercial games.

In this context, ProActive project aims to involve educators in a creative process, offering tools to be used in creativity service. As mentioned in literature (2), the innovative processes are not promoted by technical development or sophisticated tools, but rather by the behaviour of organizations and implicitly of the human actors.

The research was organized on following major activities:
- Focus group
- Training and co-design workshops
- Follow up and support
- Implementation in real settings

2.1. Focus groups

First step of including training institutions and interested educators in ProActive was to organize focus groups where, they become familiar with project's mission and vision. It was an opportunity to bring together people with different teaching experiences and conceptions about creativity and learning styles. Here, through interesting and constructive debates has been created a framework where trainers could express their point of view about creativity, GBL and teaching through games, about insertion of technology in teaching and learning, learning metaphors, their experience in teaching with or without ICT, sharing impressions.

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[2] EUTOPIA is a joint venture by ISTC CNR and NAC LAB, Dipartimento di Scienze Relazionali "G. Iacono" http://eutopia.unina.it/proactive/
[3] <e-Adventure> is developed by the <e-UCM> e-learning research group at Universidad Complutense de Madrid. http://e-adventure.e-ucm.es/

The information collected during the focus groups allowed us to explore more deeply this subject and to adopt specific strategy in accordance with target group expectations. Also, based on the information and suggestions provided by participants the functionalities of two game editors were improved.

2.2. Training and co-design workshops in pilot sites

The focus groups represented an opportunity to establish first contacts with people and institutions, and constituted a base for preparing selection of pilot site. The University of Bucharest identified and selected three pilot sites in this project, related to Leonardo da Vinci sub program (professional training).

Each pilot site has experience in distance learning and organizes different training programs according with its expertise; two pilot sites are more technically oriented, organizing courses for ICT literacy and also computer network courses. The third pilot site is oriented on programs designed for personal development and entrepreneurial education.

During two days, trainers attended to intensive training workshops, learning about Game Based Learning, creativity, learning metaphors, and technical training for <e-Adventure> and Eutopia, planning first games to be developed.

<e-Adventure> is an educational game authoring tool. 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. The core of the <e-Adventure> project is the authoring tool that allows educators with no technical background to produce their own educational games.

EUTOPIA is a platform for creating, managing and delivering Online Role Playing Games (ORPG) with a set of tools that enable to play and analyze the social interactions that take place during the online sessions. The tutor defines the storyboards and the goals of the game, for each player involved in the simulation. The content provider is the tutor who can design a plot for his/her participants to play with. Like in a theatre he / she would be the director of a piece that himself/herself wrote down or had written down by somebody else. In fact, it implements the psychodrama methodology in a digital "scene". This approach permits to a small group of people to give a theatrical performance for educational or psychological purposes (counselling, diagnosis, therapy, coaching and training in soft skills). Each actor (or learner) controls an avatar and interacts with other avatars in a virtual 3D scene.

This project offered new opportunities, questions and answers for participants. The opportunity was to improve creativity for them as practitioners, to bring something new and innovative in their classes, to work with powerful tools for creating games and also a chance to meet people sharing same vision and same preoccupation for their students. For some of the participants, this was the moment of a current activity analysis: How are my students? How is my lesson seen by the students? Is there enough interactivity and interaction in my classes? What can I do to keep them to be motivated? What motivates them? What is the mean of creating games? How can I integrate a game in my class? Is the game appropriate for my groups? These were only few questions which the project has triggered.

At the end of the training sessions, working in teams, trainers could identify the main ideas for games and learning scenarios, to be developed in the next months.

2.3. Follow up and support

After the training sessions, trainers were prepared to become game designers. They had the tools and they were trained to acquire medium technical skills and were encouraged to collaborate. During design phase UNIBUC (University of Bucharest), has offered continuous online support and maintenance for the group; several meetings were organized as debriefing sessions to offer the trainers opportunities in presenting the progress and discovering together solution to common problems.

The complexity of activities related to implementation of pilot sites, follow-up and support were imposed by the complexity of process itself. On one side important was achieving the main goal

of this project: to create educational games; on the other side with same importance was to see if this process involved creativity and innovation.

Indeed, continuous support (both pedagogical and technical), maintenance, motivation, communication, technical demands, maintaining balance and momentum were essential for this phase. The sites need to generate a vision, which could differ from one group (pilot sites) to another but strong enough to maintain interest and inspiration. The trainers had to deal with software limitations in some cases, with lack of training or technical skills, with the conflict between ideas, plans and software's affordances, and the need of adapting their designs according with the range of affordances offered could cause frustration. The assets (scenarios, characters, scenes, objects, environments) ready to be used and the need of developing new one to fit better in their scenarios required new skills (as these had to be edited with a photo editor) and also time.

These challenges brought some changes in the pilot sites by trainers' drop out. At the training sessions we reported nine trainers, at the end of the design session we had five active trainers.

In order to see if teachers designed the game in a creative way and if they were passing through a creative processes into the consortium has been created a tool, which links the phase of the creative process as it is presented in literature with the game design process. "Questionnaire on the creative process of GBL design", is a list of twenty items which can help in identification of four major stages of a creative process: Analysis phase, Generation phase, Evaluation phase, Communication / implementation phase.

Analysing the trainers' responses to the "Questionnaire on the creative process of GBL design", meant to help in identification of the characteristics of the GBL design creative process, we noticed that, in the phase of analysis, two types of motivation appeared, which are not mutually exclusive within a participant: intrinsic and extrinsic motivation. The motivation it was very important in this phase and this arises from different personal of professional reasons, becoming necessary to identify the factors which influence this motivation.

Indeed, intrinsic motivation appears related by trainers' previous experience with games (as players). They were excited to create their own game in which characters, story, actions, environments to wear a "personal stamp". In one trainer's words "*I use to play computer games, and most of the times I tend to imagine how the game will look like if the environment or characters will be different*". Another motivational fact (intrinsic) was overcoming the personal barriers.

Extrinsic motivation: most of the trainers had a pragmatic approach, being motivated to create games which could help them in teaching, to bring novelty and creativity in classes. They are aware that their courses could became boring, or with too much theory, being hard to keep students' attention for a long time. Another reason related to the extrinsic motivation was the reproduction, through games, of a real environment in which students' actions could not damage the resources. "*I teach a course in which equipments are vital for understanding the concepts. Unfortunately, sometimes, except pictures, I cannot bring with me in classes real servers, routers, switches, cables.*"

In the generation phase trainers started to create their games. The motivation remains a key success factor for further development of the game and also for improvement. The responses show that the creation process has been a pleasant experience, less frustrating or boring.

Convergent /divergent thinking: the answers show trainers had more ideas to be implemented, because they didn't know very well the editors or they had many (good) ideas. Later they chose, in their opinion "the most feasible idea". Some of them started from the idea(s) and after that they were interested how to fit this / these in the learning objectives, since others started from the learning objectives and look for an idea of game that responds to learning objectives.
Resources were important and were taken into consideration in measure in which they could estimate them (the time spent, editors' features and affordances). One trainer mentioned: "*I'm pretentions and don't want to change a good idea just because it takes more time to achieve it*".

Also, they considered their ideas complex, and that they didn't mind if their ideas were a little difficult to develop. No one chose a simple idea to be easier for developing. They tried to be "*original*" even the final result could become risky for the success of the game. The game was not actually projected through a conceptual map, preferring to add the ideas in the game editor, and see the final results. For some of them this kind of work meant supplementary efforts and time. Looking back, they are tempted to revise this type of working, concluding that maybe they could be more efficient if

they were planned more and work less with the editors. "*I should spend 10 hours to plan and 1 hour to design, than spend 10 hours to work with the editor and 1 hour to plan the game*".

During the generation phase, they experienced "Illumination" having spontaneous ideas of solving certain tasks. Usually these ideas came in the most unexpected moments.

The trainers passed the evaluation phase, which allows them to evaluate the games created, with the help of peers, for feedback, and they tested their prototype as they developed it. "*I asked my colleagues to take a look at my game, and give me a feedback. This helped me to bring some improvements in the game, but their feedbacks were important to improve my state of mind, to be more trustful*".

Communication/Implementation: In this phase, the trainers consider their games as innovative and useful and ready to be implemented in real settings. "*It is perfect for my learning scenario*". When it comes to share it with others, they are open to distribution being convinced about the success of the game.

The answers provided by the trainers who participated in the game design process revealed aspects related to the way in which each trainer planned its work in order to create an "educational product". It has been a long process, fruitful they were involved in a creative process, in which they created "learning tools" and in the next period they will prove creativity in introducing these tools in learning contexts.

III. RESULTS

The strategy adopted in co-design sessions and the work conducted together with pilot sites established a partnership between pilot sites and the coordinator of the pilot sites. In this partnership trainers brought teaching experiences/techniques, information about learners, their own knowledge and technical skills, and plans for introducing games. University of Bucharest offered pedagogical concepts during the training sessions, information about game editors, support and permanent contact and communication. At the end of the design process, the results arrived demonstrating the interest for this new teaching method. The entire team worked for successful games embedded in comprehensive learning scenarios.

There were nine educational games created, using the two game editors (EUTOPIA and <e-Adventure>) ready be used in professional training, games created by each trainer to support learning objectives:

1. "Buying a computer" a point and click game in which the player has to assemble a computer with all the components so that it becomes functional;
2. "Installing computers" – here, the player is an employee at a company which provides IT service, on probation period. He has to go to a client to install a computer, and he is supervised by his boss.
3. "First step with Photoshop" – is a trip in Photoshop world, in which player will be familiarized with Photoshop environment. Interaction is point and click. He is permanently assisted by the characters – specialists in Photoshop.
4. "Photoshop – photo editing" – in which players will learn how to use Photoshop, to create/edit new pictures.
5. "Diagnosing an Internet connectivity problem" or "Connectivity troubleshooting" - the player is a network administrator, and it has to identify and solve a connectivity problem
6. "Board meeting" – a role playing game, in which the players are employees in a big company and they have to elaborate and decide a strategy for further development of the company.
7. "Binary conversion"- players are connected into a session, in groups of 8 persons. Each student is a "byte".
8. "Job interview" – a job interview simulation, where, three candidates (players) are competing for the same job.

9. "Surviving in the desert" - role play game, each participant will assume the role of shipwrecked, fighting for his life.

Each game has been included in learning scenarios to be used by trainers in their courses. These scenarios were meant to be applied in face to face meeting but also in online sessions, according with courses' objectives. The games and scenarios were reviewed by each trainer during the design sessions, in order to respond to quality criteria related to: learning, gaming and technical aspects. Moreover, an evaluation framework allowed establishing criteria and tools for a complete evaluation: for the game, for learning scenarios, learning experience and for the impact of the project on game creators (trainers) practices and also on end-users (students, trainees, pupils). The evaluation was focused on different aspects staring with adaptation to students' profile, with objectives, players' immersion during the game, and finishing with graphical aspects.

IV. CONCLUSIONS

Game Based Learning is an innovative teaching approach, and more valuable when the educators are able to create their own games adapted to their needs. The design process could be an interesting and captivating experience, in which creativity can be employed in a fruitful way and very useful for achieving learning objectives. Creativity was employed in the process of game design and also in applying learning scenarios in real learning contexts, and the results obtained increased trainers' confidence in educational value of their games.

The games created have a real educational value and can be easily adapted as complexity or levels of challenging in order to respond to students profile.

Acknowledgements

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