



## Game-based Research in Education and Action Training

**Maja Pivec**

FH JOANNEUM University of Applied Sciences (Austria)

[maja.pivec@fh-joanneum.at](mailto:maja.pivec@fh-joanneum.at)

### 1. Introduction

Findings from the European research about the Future of Learning [1] suggest that, while the existing physical and formal structures of education and training will remain intact, learning/teaching institutions will change significantly with respect to pedagogical strategies. Learning and teaching processes will be more flexible in addressing and implementing individual needs and preferences. As a consequence, trainers, teachers will become mentors and guides in self-regulated, personalized and collaborative learning processes. Technology will assist learning institutions to facilitate personalization and institutional flexibility, and game-based learning will be appointed as one of the methodologies.

The Project GREAT (Game-based Research in Education and Action Training) [2] aims to provide methodology and guidelines for using Game-Based Learning (GBL) in education and training. GREAT is an EU Leonardo da Vinci funded project, started in October 2011 and lasting two years, and aims to provide documented ways of using Game-Based Learning within teaching-learning processes by transferring innovative methodologies, corresponding with the ICT/digital preparation of European citizens in 2020. It continues work started in the ENGAGE project [3], focusing on spreading the results in different countries and especially transferring them for different sectors and different stakeholders.

The overall objectives of the GREAT research phase are to develop a common vision for the role for GBL in training and education, to identify the key policies and instruments that may be needed, and to develop a common view of the scenarios, contexts, content, environments for better use GBL. Following target groups are defined: Trainers/Teachers; Training providers; Training VET and higher educational organizations.

#### 1.1 Research Methods Applied

Parallel to desk research, the project partnership compiled an online survey on usage of games for vocational training, carried out in-depth interviews with stakeholders, and an international expert focus group was hosted on 26-27<sup>th</sup> February in Graz, Austria [4]. This focus group was organized with the aim of providing a platform for international experts on serious games, game-based learning, e-learning and training, and to have the opportunity for joint discussion on the subject matter, analyse the state of the art, and enable discussions on focused issues.

### 2. Strengths, Opportunities and Main Innovative Aspects

Combining different approaches, the partnership gathered information from companies, training institutions, and stakeholders about the existence and the use of games for learning and training. There were 540 completed responses to the survey from 32 different countries, both inside and outside the European community. Over 20 stakeholder interviews in Austria, Hungary, Slovenia, Portugal, Romania and Turkey were carried out, and 16 international experts contributed to the focus group. First preliminary results are collated and outlined within this paper in a form of a modified SWOT analysis.

#### 2.1 Strengths of Using Game-based Learning Methods

Detailed analysis of in-depth stakeholder interviews highlighted strengths and potentials of using game-based learning approaches using a variety of non-digital and digital games. Games were business games, role-plays, round-based business simulation games, scenario-based games, management games, mini games, bingo and hangman. The results are tabled below.

- Students live online in virtual spaces and would enjoy this kind of approach.
- Would increase tool kit diversity for teaching, linked with motivation
- Would result in greater involvement with more students participating concurrently.
- Games offer open environment for learning (it was only a game, so they don't feel that they can say something wrong).
- Games contribute to a richer learning experience.
- Students are engaged and self-reflective.
- Games used as a method for memorizing (e.g. vocabulary), increasing attention, better understanding and gaining self-confidence.
- Games can be used in the field of using computer technology for communication and collaboration.
- Games can be used to discuss behavioural patterns, to express feelings or thoughts, as essential elements of education.
- Games can increase the motivation to learn and grab student's attention.
- Can help better understand the dynamic application of content learned.
- Can enable better understanding of the importance of training, thus motivate students to learn and improve.



- Can provide positive feedback of increased competences to the students, when they have to reach clear goals and see how they are performing.

Added value and benefits of the learning experience are outlined as follows:

- Participants liked playing the game as opposed reading the proposal and commenting
- Working with the game case scenario participants are much more active, contribute with comments
- Students have been able to connect theory with practice and to develop more effective learning/communication strategies.
- By using the game students can easily see the most important co-relations between different functional areas in the company.
- Students can face a real working environment.
- Development of problem solving skills (problem situation / according to the decision), which can be developed individually or in small groups.
- Evaluation of management performance and possibility of self-reflection and positioning against the desired profile (focus on training)
- The participants feel save, it is not forcing them to contribute like in the classroom, it is open environment, they enjoyed it also psychologically
- I also learned as the trainer using the game (improving structuring and presentation of cases and examples).
- Game language was English, cards / options were in English, the game also helped to form and express better their thoughts in a foreign language that they have to use at their work.

## 2.2 Opportunities and Main Innovative Aspects

In the distance-learning mode there is no face-to-face contact, therefore digital games are appropriate environments, so students can gain "learning to learn" competences important for their studies. By experimentation within a safe digital environment, one can analyse conflict, try out how to react in certain situations, functional competences (language, communication and negotiation skills), social, personal, cultural sensitivity, and easier transmit ethical competences via digital games.

Role-play scenarios were successfully applied for learning and improving EU project management skills. Games covering cultural differences can be very useful within this context. People don't like to hear about stereotypes, therefore it is difficult to prepare the training and corresponding examples based on conventional approach.

Games can also foster interdisciplinary learning, emphasising different approaches to the accounting topic by means of inclusion of social aspects and sustainable behaviour. One can easily explore accounting in relation with company processes, illustrate basic ideas and changes in capital management, or plan company strategy. Working on planning and problem solving in teams contributes to the acquisition of team competences.

By presenting visual materials and information in various ways, digital games stimulate different thinking, perception and reflection, and can be used to improve cognitive skills, soft skills and self-esteem. Group games can be successfully used to develop empathy and motivate to change thinking, personal attitudes, perception and behaviour. Games can be very effective in increasing vocabulary and speaking skills. The topics of digital games could also focus on the main topics of curricular courses (such as marketing, logistics, finance, management, mathematics, etc.), or sparking the interdisciplinary approaches to learning and innovation.

Games should be designed or selected in-line with specific learning objectives of the modules or courses for which they are intended. They should allow:

- Involvement of the discussion of case studies, examples of business realities to simulate the resolution of specific problems of companies and/or economic sectors;
- Involvement and participation of different generations, working, playing and learning together;
- Involvement and working with experts and non-experts, within the same group, where experts will support and monitoring students along the game;
- Involvement of teamwork and distance collaboration, students and trainers solving questions separately in time and space.

Benefits of digital games are to be able to parcel the game and related play into several units, and to save the game at different points. One can have single-player and multiplayer versions of the same game, thus fostering self-paced learning or learning in teams. Games, if used for independent study or in form of homework, can increase the effectiveness of learning time.

## 3. Barriers for Usage of Game-based Learning Approaches

Based on analysis of interviews, weaknesses and barriers to implementation of game-based learning and related activities were identified as follows:

- complexity of activities
- duration time of game-based activities
- meeting the learning objectives
- language of the resources
- competences of the learners/trainers
- technical equipment needed/available



Time is an important factor for part-time students and distance students, where programs, teaching and learning are very work intensive and in parallel students are still working. It is difficult to introduce games that not cover specific learning objectives or take too much time. Therefore teachers and trainers usually prefer simpler role-plays, which need less time to carry out the game. There is need for tailor-made games that cover or can be adapted to specific learning objectives. To increase the learning effect, it is also important to plan for the debriefing phase.

Some of the game-based resources are available only in one language. This limits the applicability of resources presenting a barrier for teachers and learners. However, commercial off the shelf games are released with language packs that allow a broader use.

Some of non-digital business and project management games are very expensive (4000 – 6000 €) and therefore less affordable. Non-digital version of the game is also deterministic i.e. students can follow only given script and make decisions within the set frame. Students cannot experiment further with changing additional parameters and exploring the interdependencies, limiting the learning experience.

Teacher and learners must have clear understanding how the game exactly works (rules, time, etc..) and how to get additional help if needed. An introductory session should explain “how to”, and allow for enough time to explore the resources, discuss the preparation and main steps of the game, and to introduce learning goals and objectives of the game.

We also must consider the availability and characteristic of computer technology, internet connection and organisational rules, regulations and restrictions regarding usage of computers (e.g. no download possibilities, no Facebook access, version of installed operating system, browser, software, etc.).

#### 4. Conclusions

The major challenge of educational and training institutions is to achieve more by using less resource (financial, human, etc.). Therefore it is difficult to justify additional intensive preparation time that is related to introduction of changes into teaching practices. There is also the challenge of the assessment of learned results, produced material and reached learning objectives by means of digital games, as well as the difficulty in finding a game that covers required topics and learning objectives in a specific learning setting. Learning material must also meet the needs of private and public organisations, i.e. cover needs from different sectors for the same activity.

To achieve results teachers need competences to be able to integrate digital games into the classroom, familiarise themselves with the game-based methods and the games themselves. Institutions must invest time and resources to up-skill teachers and to allow for the time necessary to modify pedagogical approaches.

#### References

- [1] The Future of Learning: New Ways to Learn New Skills for Future Jobs. Results from an online expert consultation. Retrieved from [http://ftp.irc.es/EURdoc/JRC60869\\_TN.pdf](http://ftp.irc.es/EURdoc/JRC60869_TN.pdf), on 19<sup>th</sup> of March 2012
- [2] GREAT (Game-based Research in Education and Action Training). Retrieved from <http://www.projectgreat.eu/>, on 19<sup>th</sup> of March 2012
- [3] ENGAGE. The portal for game-based learning. Retrieved from <http://www.engagelearning.eu/>, on 19<sup>th</sup> of March 2012
- [4] Project Great Expert Group meeting, on February 26<sup>th</sup> and 27<sup>th</sup> 2012, in Graz, Austria. Retrieved from <http://www.projectgreat.eu/great/default/activities>, on 19<sup>th</sup> of March 2012.