**«Gamification is not (just) a game but it is an important material
for on line distance learning»**

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Abstract: The article is focused on the phenomenon of gamification in education. The basic idea behind that is to show the use of gamification in Online learning environments. For this reason we present data on the design, implementation and evaluation of the online project "building the school of the future" which was implemented on the asynchronous learning platform in the Directorate of Secondary Education of Drama from October up to November 2015. Four hundred and fifty seven (457) teachers from forty-nine (49) regions of Greece were involved in the project. These teachers, on the basis of a scenario which guided the whole process, undertook a series of initiatives in order to design and propose the school of the future. The research project was a coordinated procedure by which the application of interactive stochastic models and the gamification model attempted to strengthen the interaction among the participating teachers. From the evaluation of the process, it became clear that in online environments of asynchronous learning where the participants are located in a distance of place and time, the reinforcement of their interaction with gamification techniques must be a major part of the design of training as it contributes substantially and decisively to the achievement of the objectives initially set.

Keywords: gamification, adult education, online learning, project, experiential and reflective learning.

1. Gamification is not a game

The term "gamification" was introduced by Pelling (2011) and refers to the use of computer games methodology and techniques, translated into texts and activities, to improve the learning experience of users, enhance their engagement in the learning process by encouraging and motivating, enhancing the sense of purpose and intimacy in the various processes. Based on the above, transferring the philosophy of electronic games to the learning process, we use the students' psychological predisposition to play. However, gamification is

not a game. Kapp (2012) defines gamification as a cover to add the interactivity, engagement and immersion that leads to good learning.

Michał Jakubowski (Jakubowski, 2014) states that gamification has risen as a trend around 2010 as it started to become used worldwide in various areas from business to education. That term had been used for the first time in 2002 by Nick Pelling (Pelling 2011) but it was just too early for the proper adoption of the concept. There are plenty of gamification definitions, but Jakubowski suggests using these two:

I.   Gamification is the use of game design elements in non game contexts (Deterding, Dixon, Khaled, & Nacke 2011)

II. Gamification is the process of game thinking and game mechanics to engage users and solve problems (Zichermann, Cunningham 2011)

During early hype on gamification in 2010 Lee Sheldon started his course called "Multiplayer game design". He reconstructed classic course structure into gamified one using mostly point mechanics and some narrative elements. Passing tests and exams became fighting with monsters(Sheldon 2010).

Another detailed description of the uses of gamification in education was done by Karl Knapp in his book "The Gamification of Learning and Instruction: Game based Methods and Strategies for Training and Education" (Kapp 2012). Although the content of the book is quite similar to the work of Mr. Knapp, the book contains well structured knowledge and meaningful insights that were inspiring to the author.

2. Theoretical data of the project

Theoretically, the project followed the stochastic model of Boud, Keogh, Walker (2002), dominated by the return to experience, the approach of emotions and the re-evaluation of the experience. The work in the groups as well as the interaction developed was based on the reflective interaction model "Reflective Interaction through Virtual Participants" (Κιουλάνης, 2013).

The parallel activities developed during the training were designed and based on the theoretical framework of project zero and the artful thinking palette (Artful Thinking, 2016). The gamification techniques which were applied were:

- Challenges
- Tests
- Narration
- Heroes
- Progress

- Evolution

- Rewards

- Points

- Rules

- Instructions

- Time

The project was developed in five (5) working groups. The teams worked using the Jigsaw Strategy (Tuparova, Tuparov, 2009). Of the five groups, four were regional groups (East, West, North, South) and one was the group of reflection.

The main scenario of the process was associated with VP1, VP2, VP3, and VP4 virtual participants (VPs), who met on a virtual on-line training trip starting from the group of reflection (all the participants)and later they divided into four groups named after the four parts of the horizon.

A characteristic feature of the VPs was that they were moving in specific theoretical contexts, which meant that they interpreted the knowledge, events, situations and reality they were experiencing on their voyage under the perspective of these frames, and on that basis they discussed issues that emerged with the other participants.

In more details:

Virtual Participant 1 (VP1): He/she does not aim at justifying his/her beliefs, assumptions and knowledge but merely to use this knowledge and with the way things usually happen. He/she acts based on his/her habits without any justification or critical examination of his/her knowledge, attitudes and beliefs / assumptions. He/she usually rejects anything new and has a kind of fear for any change. He/she often makes hasty judgments, without reflecting on the consequences and he/she is also characterized by a narrow view of things, without looking for any alternatives or original solutions. He/she promotes the non reflective learning, the non learning and the rational action and generally expresses the teacher who is interested in the everyday usual things without any further search.

Virtual Participant 2 (VP2): He/she is characterized by intense critical and reflective mood. He/she does not seem willing to accept anything uncritically and through his/her communication and interaction with the participants he/she drifts the latter in a reflective activity. Thus, he/she promotes reflection, reflective action, critical thinking and reflection in action.

Virtual Participant 3 (VP3): He/she intensely thinks of the potential risks, problems, difficulties, disadvantages and negative effects that may arise in any case. His/her way of thinking moves towards established patterns and stereotypes. Through his/her interaction with the participants of the course he/she promotes "vertical thinking" which processes

already existing ideas. He/she focuses on the logical analysis of data, correlation, evaluation and finally the search for the unique and correct solution of any problem. In this context between the skills of critical thinkers he/she proposes concentration and management of the relevant information, data interpretation, evaluation of evidence, indication of the existence of logical relationships between various proposals, understanding of language use with precision and clarity, creation of documented conclusions and generalizations.

Virtual Participant 4 (VP4): He/she is extrovert, optimistic, flexible, with positive and creative way of thinking, interested in anything new, creative and alternative. He/she thinks and acts out of the conventional rules of everyday life as he/she is based on a novel way of looking at things and promotes creative and lateral thinking. His/her basic elements are the production of more ideas, solutions and answers to problems, flexibility, that is change of the strategy or the way of thinking, originality in the sense of affinity with the unusual and perfection in the expression of details and the organization of ideas in broader and more comprehensive figures.

3. Implementation of gamification techniques

As we have already referred, the gamification techniques which were applied were challenges, tests, narration, heroes, progress, evolution, rewards, points, rules, instructions, and time. In particular:

3.1. Challenges – Tests

We have transformed learning goals into increasingly challenging trials, as this has increased the motivation and involvement of participants. For this reason, and according to the project's central scenario:

"a group of teachers from all points of the horizon discover a secret map that leads them to the annual project "building the school of the future".

(Building the School of the Future, 2015).

From there, they launch an exciting online journey to unlock the school of the future. The process consisted of four parts (scenes), which appeared on the platform gradually.

3.2. Narration – Heroes

We placed the participants as the protagonists of history trying to emphasize their emotional commitment as we activated our internal learning motivations.

For this purpose the instructions given were:

"You have the secret map in front of you and you start the path to the school of the future. The course is difficult, uphill and obstructed. However, the most important obstacle seems to come from six (6) guards, who do what goes by their hand to make life difficult and deter you from reaching your destination. In this endeavor you will have four classmates as your assistants who have come together randomly after years in this lesson".

The classmates were "Martha", "Iason", "Dimos" and "Paraskevas". All four of them participated in their own profile in the online process, but they were the four Virtual Participants we described above (Building the School of the Future, 2015).

Along with the classmates, there were the six watchmen of Tower, who essentially embodied characters and situations of everyday life and expressing situations such as jealousy, envy, lie, hypocrisy, etc.

The six watchmen of Tower were "Pinocchio", who tried to prevent participants from targeting them by sending false news to them and the "Monkeys" who were meant to divert the participant by conveying misleading news and comments. It was also significant that "Nikolo" and "Babis" were present who expressed the doctrine "the purpose of sanctifying the means" and also "Mr. Sophocles", who attempted to hurt the creativity of the participants using the bureaucratic gears. The puzzle is complemented by "Stavrakas" with the main weapon of jealousy for the progress of others.

3.3.   Progress - Evolution - Rewards and Points

The main elements we used in this perspective were the keys which were given in the lesson. Participants based on their progress, as it appeared through their participation in the course's activities and exercises, were given special keys by lesson facilitators, useful in unlocking the Tower of Knowledge of the School of the Future

The main keys of the course were:

- Critical Thinking

- Flexibility

- Methodicality

- Popularity

- Interaction

- Success

3.4.   Rules - Instructions and Time

Rules are an essential component of learning activity and must be clear. This is why there have been time constraints in the learning process. Losing points or rewards, one could redesign his course to finish the next time at the predetermined time.

4. Research

The subject of the research was to study the interaction between the participants and the ways in which this can be enhanced in remote online learning environments using mathematical techniques.

In order to analyze the content of the messages more thoroughly, we used the analysis of social networks as a method that synthesizes a theoretical background for understanding the structure of a network and the interactions developed within this network (Χλαπάνης, 2006).

The study of social networks was carried out through the theory of graphs. The graphs are a mathematical model that represents the structure of a network. Each graph is essentially an image consisting of a set of points (vertices or nodes) associated with lines (edges) that represent relationships. Users appear as nodes of the graph and the edges correspond to the interaction between the users (of each node).

To measure of graphs the Graphviz environment was used which is an open source software and used to create and display graphs.

From the fora that were developed, the forum "The Final battle"was selected where the participants give "their final battle" to conquer the "key of knowledge" on the basis of which they would "unlock" the "Tower of Knowledge of the school of the future"

Due to the huge amount of data on the "battlefield" network and the need for very large computing power, we limited the data as much as possible in a way that would not alter the results in order to achieve a representation. Even after the limitation, however, the data were a lot because of the many participants and their two-way interactions, resulting in enormous graphs. The following picture shows a snapshot of the "Battlefield" network structure, where four Virual Participants were distinguished as four nodes, which were also of particular importance in the development of the forum (VP1 - Green), VP2 - Yellow, VP3 - Purple), (VP4 - Red). At the same time, we observe an image consisting of a set of knots connected to lines (edges), which essentially capture the interactions between the participants (Picture 1).

Picture 1. Graph of the final battle
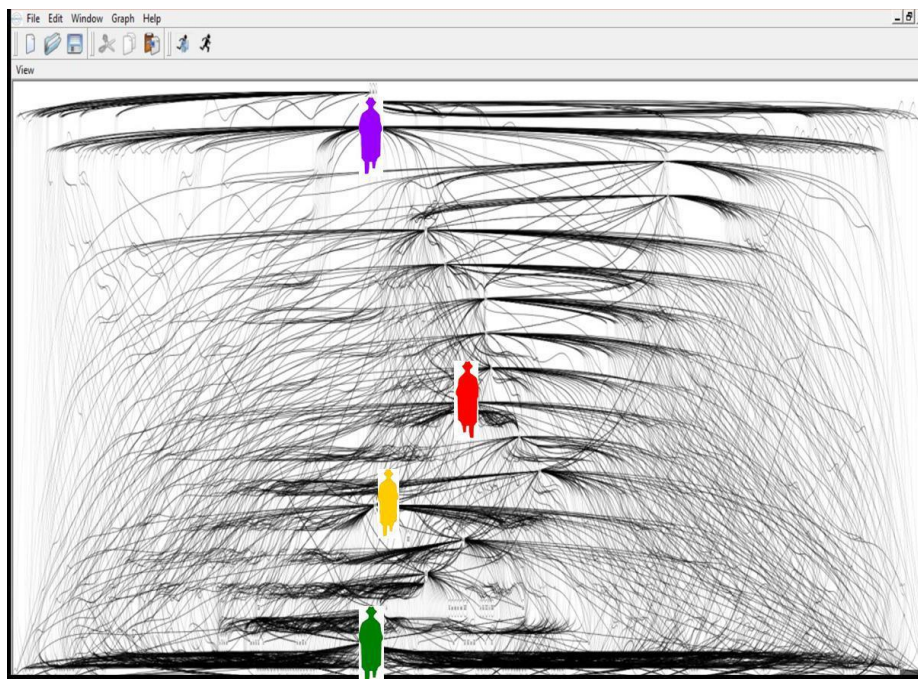
In the picture there are many of the graph theory elements that show the increased interaction in the particular forum snapshot. In particular, the thickness of the edges reveals the volume of interactions based on the number of interacting messages, ie it expresses the existence of more exchanges of messages and thus relationships. The degree of in-degree in the graph, ie the number of edges ending in it, and the out-grade, ie the number of edges originating from it, is large and leads to the sum of the indegree and out-grade at high levels.

Conclusions

The use of gamification techniques in the learning process has enhanced collaboration among participants in the online learning environment. In online learning, activities that increase social interactions are essential and must be sought within a context of communication and collaboration with trainees to be close to their interests and desires. The Total Interaction of the Social Network tested reached very high levels, as well as the sum of the individual active interactions where in some cases each participant interacted with all the participants. Gamification techniques were indispensable elements for participants to understand what they have done at all times. In this way they felt they had control of the lesson, which reduced fear and anxiety. It was also important to provide rewards through the keys that were shared. Alternatively these items could be coins, badges, medals, trophies, treasures and more. It seemed that the rules and timelines are an essential component of the learning activity and that they should be clear and adapted to the level of the participants. The implementation of the course as well as the research showed that the application of gamification principles to all phases of the learning process leads to the development of relationships that result in

cooperation and knowledge building and this is reflected in the learning products and the quality of learning.

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