



THE ESCAPE GAME: A TOOL TO FOSTER STUDENT CREATIVITY

Zarina M. Charlesworth*, Aleksandra Vuichard**

*Professor and EMBA Program Director, HEG Arc School of Business, University of Applied Sciences & Arts Western Switzerland (HES-SO), 21 Espace de l'Europe, 2000 Neuchâtel, Switzerland zarina.charlesworth@he-arc.ch. *Teaching assistant and doctoral student at University of Teacher Education, HEP Vaud, 33 Av. de Cour, 1014 Lausanne, Switzerland and University Paris-Est Créteil, 61 Av. du Général de Gaulle, 94000, Créteil, France aleksandra.vuichard@hepl.ch **

ABSTRACT

The 21st century is one of evolution and change. The impact on education is now being felt at all levels and concerns students of all ages. Keeping in mind the changing skills set that industry expects from graduates, one that includes competencies such as creativity, flexibility, and critical thinking, it behoves educators to find ways to innovate in their classrooms in order to develop such skills. Drawing on experiential learning and principles of gamification an ongoing mixed-method's project is currently evaluating the use of an interactive exercise as a way to impact student engagement and motivation as well as examining the creative processes brought into play and the emotions felt by the participants. An escape game was designed specifically for final-year Masters students (n=10) in answer to these objectives. An in-depth analysis was carried out using a variety of methods from observation to text analysis. Both quantitative and qualitative results support a positive relationship between motivation to learn, creativity, and emotions felt. This paper presents an in depth analysis of the qualitative results alone. Quantitative results will be published subsequently. Findings are discussed in terms of innovative classroom practice and will be of interest to educators, instructional designers and programme directors alike.

INTRODUCTION

Educational paradigms are currently undergoing change and this due to several factors. Two of these, and not the least of which, are ease of access to information



and the evolving time-distance conundrum. Additionally the skill sets that are now in demand are different from before, including many more soft skills such as creativity, collaboration and problem-solving (World_Economic_Forum, 2016). Not only does industry recognize a need for such skills but the next PISA administration will also be looking to assess “flexibility in thinking and habits of creativity” (Anderson, 2019, p. 3).

A major implication of these factors concerns the role of educator who, more than ever before, needs to provide value to the learning experience through orchestrating the course delivery in a manner so as to actively involve the students. Without entering into the intrinsic versus extrinsic motivation debate, the onus, in the Western European higher education classroom, is largely on the shoulders of the educator. Although less to motivate the students but rather to create conditions under which the student is motivated on their own (Mishra & Kotecha, 2017) and provoke the kind of engagement that will result in learning.

Here we touch on experiential learning theory (Mandeville, 1998, 2001, 2004) or “active learning where the learning is a student-centred activity” (Banfield & Wilkerson, 2014, p. 291). This in turn has led us to examine a subset of experiential learning which is gamification. Here one finds the use of game elements in non-game settings (Deterding, Sicart, Nacke, O'Hara, & Dixon, 2011) in order to engage, motivate, encourage problem-solving and learning (Kapp, 2012). Game theory also provides insight into student perceptions (Barata, Gama, Jorge, & Gonçalves, 2013; Cheong, Filippou, & Cheong, 2014), on how their participation might be improved.

Within the realm of games, one finds serious games, simulations and more recently classroom escape rooms. The practice-based research presented in this paper looks specifically at the development and implementation of an escape room in answer to some of the afore-mentioned challenges.

LITERATURE REVIEW

This research is at a crossroads between the development of skills such as creativity and divergent thinking and the use of innovative techniques in the classroom. Accordingly we have drawn upon two bodies of literature. The following sections provide a brief review of creativity and gamification.

Creativity

Creativity is a subject widely discussed by a large number of disciplines. It touches on many different fields such as psychology, art, personal development, business management, etc. Creativity is a very broad concept and cannot be restricted to a single definition. Depending on the discipline and its theories, there are many definitions in the field of psychology (Guilford, 1950; Sternberg & Lubart, 1995,



1996; Torrance, 1972). This research refers to Lubart's (2003) and (Sternberg & Lubart, 1999) multivariate approach to creativity for its theoretical framework. The evolving nature of teaching and learning paradigms coupled with changing demands on the graduate skill set, makes Lubart's model, which advocates the development of creativity and flexibility, particularly pertinent.

According to Lubart's multivariate approach, creativity is defined as "the ability to achieve production that is both new and appropriate to the context in which it occurs" (Lubart, Mouchiroud, Tordjam, & Zenasni, 2015, p. 10). In this approach, creativity is seen as a combination of four factors: cognitive, conative, emotional and environmental factors. Cognitive factors refer to the intellectual abilities that facilitate and influence creative thinking; conative include personality traits and motivation. Moreover, the emotions influence creativity in different ways depending on their status. Finally, environmental factors such as school, family, cultural and social backgrounds and new technologies influence the creativity. In this representation, creativity, like any other cognitive skill, can be stimulated and evaluated: due to the fact that there are several components that influence the realisation of creative potential. In education, creativity is seen as a perspective for improving student performance. As such, Craft (2005) emphasizes the importance of promoting creative learning to merge and assemble the knowledge.

Creativity is also increasingly present in both academic curricula and in students' training (Capron Puozzo, 2016a). In order to allow students to exercise cross-curricular skills (Coppey Grange, Moody, & Darbellay, 2016) such as critical and divergent thinking and creativity, the educator's approach to teaching and learning needs to be innovative if not different. By training student teachers, as in our sample population, in methods of creativity, they in turn will be better able to develop such skills in their students.

Encouraging creativity in a school context can refer to various performances that would be proposed in class (Capron Puozzo, 2016b) such as the production of texts or songs, choreographies or sketches. As Rey and Feyfant (2014) state, "creativity is often associated with innovation, whether at the level of the system, the educational institution or the individual" (p. 1). In this sense, it is necessary to integrate creativity into the learning process. The latter consists in implementing learning methods with the aim of stimulating the learner's creativity by inviting him/her to use his/her imagination.

For the development of creativity amongst students one must address the question of how best to do this. This project chose the path of games.



GAMIFICATION

The use of games in learning is age old with the more recent game-related literature having its roots in the pedagogical concepts of constructivism of the 1980's and 1990's and closely related to experiential learning theory (Kolb, 1984). The concept of gamification, sometimes still incorrectly referred to as Game-Based Learning (GBL) (Caponetto, Earp, & Ott, undated) has now come into its own. As can be seen in the publication of several comprehensive reviews of both the research and the academic literature (Caponetto et al., undated; Huang & Soman, 2013) there is no longer any real doubt that the gamification of education is making its way into mainstream learning. Its use is in line with the 21st century push towards learner-centred education.

The definition of gamification used here is taken from Deterding et al. (2011) where "Gamification is the use of game design elements in non-game contexts" (p. 10). In order to understand the context, one must first see what is meant by "game". According to Deterding, Dixon, et al. (2011) game studies distinguish between "gaming" and "playing" with the former being considerably more structured versus the latter which remains exploratory and with little or no restrictions.

As Salen and Zimmermann point out (2004) "the real domain of game design is the aesthetics of interactive systems. Even before computers existed, creating games meant designing dynamic systems for players to inhabit. Every game, from Rock-Paper-Scissors to The Sims and beyond is a space of possibility that the players explore. Defining this space is the collaborative work of the game design process" (p. 2). Such learningscapes may be in either virtual or physical worlds.

Finally, although there is little empirical evidence on concrete benefits of using games in education there are clear links with an improvement in student participation and motivation. Games can be seen to provide challenge which can prevent students "from becoming bored or frustrated and allows them to experience flow" (Barata et al., 2013, p. 1). This can be linked to the idea that the participants "inhabit" the time/space of the game.

One option within the panoply of game designs available to educators desirous of integrating game elements in their teaching is the use of escape rooms. Following the successful introduction of a video escape game in 2004 in Japan by Toshimitsu Takagi (Lock Academy, undated), it was only a matter of time before a live escape room also in Japan and in 2007 was made available to the public. The use of escape rooms took on and in the past ten years has made its way around the world. Originally considered a leisure activity, escape rooms have now made their way into education and are now used as a pedagogical tool from primary through to higher education.



All escape rooms, whether in or out of the classroom, follow "the principles of gamification wherein the features of games (e.g. rules, challenges, immediate feedback, permission to fail) are applied in contexts normally not associated with games and play" (Carrion et al., July 2018). Such activities are generally carried out with several teams and can a variety of objectives from fun and games to collaboration and teamwork (Zhang et al 2018), the exercise or development of soft skills (Clarke et al, 2017), or even for exam preparation (Carrion et al., July 2018; Vörös & Sarkozi, 2017).

Given the versatility of an escape room it seemed an obvious choice for this project. The research focused on the student's perception of the use of an escape game as a pedagogical tool. Our main research question was "To what extent is an escape game a creative exercise".

The objectives behind the use of an escape game use were two-fold, on the one-hand strictly pedagogical and on the other research-oriented:

1. to increase both student engagement and motivation through the use of an escape game focussed on the development of a literature review and;
2. to see what emotions the students themselves identified during the exercise;
3. to get feedback on the student's perception of the escape game activity.

METHODOLOGY

The field was a College of Teacher Education. Participants in the research comprised students (n=10) on a master's degree course for secondary school teachers. Three students were female and seven were male (mean age=28,6; sd=2,22; span=23-31). An escape game was developed for use within the scope of an elective course on creativity development. The choice of an escape game was to allow the integration of game elements in the course delivery with the learning outcomes being:

- the exercise of critical and divergent thinking in a creative manner;
- a hands-on creative learning experience that teachers in training could later adapt for their own practice.

The game itself was created to include three main educational objectives: appropriation of theory, literature analysis, and concept association. The resources at hand included access to the entire Teacher College building, sufficient staff resources to accompany the student teams, technical support for the filming of all the student teams as well as containers and locks for the game. In terms of puzzle path design, a linear path, which calls for the solving of the first puzzle in order to proceed to the second and so on, was chosen. This provides a more guided experience, is easier to design (Wiemker, Elumir, & Clare, 2015) and works well with small groups promoting collaboration amongst team members as they all work



on the same puzzles together. In order that each team, three in all, could work simultaneously, three different scenarios were developed. Each scenario had a variety of puzzles and different types of hints were used.

This paper presents selected qualitative findings. Quantitative analysis based on the Creative Process Report Diary (Botella, Nelson, & Zenasni, 2017) is currently ongoing and will be published subsequently.

Throughout the semester students were invited at the end of each creative activity, only one of which was the escape room exercise, to keep a record of their experience in their course diaries. The qualitative findings discussed below are based on student records of how they perceived the experience in terms of learning and emotions felt.

Qualitative methods of analysis (Miles & Huberman, 2003) were drawn upon for the diary analysis and observation and included:

1. the coding of student course diaries;
2. triangulation (Tashakkori & Teddlie, 2003) through observation and filming of the student participation in the escape game;

Complementary to the above was an in-class debriefing session for which notes were taken.

The game itself was conducted during regular class time. Three student groups worked on different scenarios which drew on required reading texts in a novel manner calling for students to be creative in their search for solutions to the puzzles.

FINDINGS

In response to our main question, the qualitative course diary results show that students were unanimous in their evaluation of the escape room exercise as a creative way of learning and felt positively about their experience. The debriefing with the students that took place immediately following the exercise was in line with this and will be further developed in the discussion.

- Objective 1 was to impact student engagement and motivation. The results, as shown through the observation and filming as well as through course diary analysis, were positive.
- Objective 2 allowed for the identification of the emotions felt by the students during the exercise. The most pertinent were: curiosity, enthusiasm, pleasure, and frustration.
- Objective 3 provided feedback on students perception about the escape game activity.



The course diaries have allowed us to illustrate students' perception about this creative activity. From the questions asked to participants (i.e. "What emotion(s) did you feel during the creative experience ? "; "Free comments about the activity ?"), we chose to code the word or phrase by inferring the category of their perception, if it was not explicitly named, based on the lexicon used as well as the wording of the phrase, which could show students' engagement and motivation in activity, interest, critical posture, emotions felt).

In this type of case, the coding is explanatory (Miles & Huberman, 2003) (see Table 1 below for a detailed verbatims).

In the coding, it appears that the participants report positive statements such as enthusiasm, excitement and motivation about Escape game. Interestingly, participants have identified these statements at the beginning of the creative process experienced.

Most participants find that practicing of this creative activity was a good idea. They have also noted this activity useful as a pedagogical tool in the classroom. Emotions felt identified include: joy, curiosity, enthusiasm and pleasure Nevertheless, some participants were critical of the proposed activity and expressed disappointment and demotivation, especially at the end of the activities. In addition, some of the participants felt frustrated during this activity.

Table 1. Students' perception about Escape game

Engagement and motivation: - <i>"I was motivated and enthusiastic about doing the activity. The challenge of solving puzzles is very exciting."</i> - <i>"I was very excited. I loved it. I wanted to go faster, run, etc. Sometimes I was a bit afraid to be wrong, but at the end I had some good ideas."</i> - <i>"Excitement at the beginning of doing an escape room, slight disappointment at not being stuck in a room - "escape room.""</i>
Positive perception (Interest): - <i>"A creative way to bring material to a student."</i> - <i>"Otherwise, the TOP idea! Thanks for the commitment." // "It was a very good idea."</i>



- *“Do it again!” ...Do you have any resources for history and geography?”*

Negative perception (Critical posture - evaluation):

- *“Annoyance “*

- *“Disappointment with the word imagination” Boring towards the end.”*

- *“At first I was very enthusiastic but then after having struggled with 3 enigmas, I felt demotivated. The riddles seem a little rough to me.”*

Emotions:

“Joy”; “Pleasure”; “Curiosity”, “Frustration at the end”; “ Anger “.

DISCUSSION

This research takes up the challenge of integrating creativity in educative practice through exposure to such practices in the realm of teacher-education with the goal of their being duplicated in the classrooms, present or future, of those involved.

In terms of engagement and motivation the results support the use of an escape game, in other words, experiential learning, to create optimal learning situations in which students are engaged. Not only was the written diary feedback positive but the observation and preliminary film analysis confirmed the high degree to which the participants were involved.

The feedback obtained during the debriefing went considerably further than the students' perception of the activity as noted in their diaries. As seen above the perception reported was both positive and negative. Students explained that they found this activity useful for their teaching practice: *“A creative way to bring material to a student.”*; *“It was a very good idea.”*; *“Do it again!” ... “Do you have any resources for history and geography?”*. However, some of the participants provided a more critical evaluation of the Escape game experience: *“At first I was very enthusiastic but then after having struggled with 3 puzzles, I felt demotivated. The puzzles seem a little rough to me.”*; *“Disappointment with the word imagination” ... “Boring towards the end.”* These statements referred not only to the



context in which the exercise took place but also to the experience of the creative process. The results of this study show that, overall, this creative activity was appreciated by future teachers who chose to participate in the module. It is also shown that positive emotions were particularly intense during the escape room activity. Although participants felt in particular enthusiasm and pleasure, to a certain extent frustration and disappointment were also felt during the exercise.

CONCLUSION

Educators, more than ever, need to respond to both the demands of students as well as those of society. Teacher educators are at the forefront and need to be cutting edge in their course delivery. This research goes the distance by integrating competence acquisition through experiential learning providing participants with the kind of tool that will allow them to go confidently into the future as it will have a positive impact on their educational practice. Moreover it looks at innovation in the higher education classroom. Educators need to bring added value to their lessons if they want to have motivated students. Pushing students to develop the skills they will need in their professional lives without teaching them the skills but by allowing them to discover and experiment themselves is one such value-adding option.

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