

AN ESCAPE ROOM APPLICATION IN PERFETTI APPROACH WITHIN OCCUPATIONAL THERAPY BACHELOR'S DEGREE

Cristina Gómez Calero ^a, Miguel Brea Rivero ^b Desiré García Lázaro ^c

^a Department of Physical Therapy, Occupational Therapy, Rehabilitation and Physical Medicine, Universidad Rey Juan Carlos, Avenida Atenas s/n, Alcorcon, 28922 Madrid, Spain. email: cristina.gomez@urjc.es

^b Department of Physical Therapy, Occupational Therapy, Rehabilitation and Physical Medicine, Universidad Rey Juan Carlos, Avenida Atenas s/n, Alcorcon, 28922 Madrid, Spain. email: miguel.brea@urjc.es

^c Department of Financial Economics and Account and Modern Language, Universidad Rey Juan Carlos, Madrid, Spain. email: desire.garcia@urjc.es



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Abstract

Introduction: The European Higher Education Area brought new challenges to teaching methodology. Gamification and the use of games are considered beneficial to promote learning and improve academic results (Bermejo, Rodríguez & García, 2019; López Raventós, 2016; Rodríguez & Santiago, 2015). However, there is a lack of studies, particularly in degrees of

health area (Da Silva, Faro, Alves & Morais, 2017, 2019; Perrier Melo, R. J., Brito Gomes, J., Melo de Oliveira, S. F. & da Cunha Costa, 2016).

Objectives: to evaluate the effect of an escape room experience as a learning method in Occupational therapy Bachelor's degree students.

Method: a pilot study was performed. The escape room based on a clinical method was developed to work in the classroom. 50 participants were given 10 minutes to solve puzzles and riddles. A Google Form design questionnaire evaluated the level of participant's satisfaction. Kahoot! formative tool was used to provide instant feedback and as part of the game-based learning design.

Results: 62.5% of participants considered a very good idea the use of an escape room as a learning method while 55% thought it was also very helpful to integrate concepts. 65% felt it was a very good method to enhance participation in the classroom. And 97.5% of students would like to repeat the experience to reinforce knowledge.

An improvement of 0.66 points was found in the students marks with regard to previous academic year with no gamification experience.

Conclusion: The experience of an escape room applied to a teaching-learning process is more motivating and might help consolidate knowledge.

Key Words: Higher education, Learning, Teaching, Occupational therapy.

Introduction

Innovation and redesign of teaching methodology applied to higher education with the purpose of increasing student's motivation and interest is becoming a new challenge for lecturers at universities. The European Higher Education Area brought a change of mind in curricula design within the courses in undergraduate studies. Promotion of autonomy in student tasks and teamwork, among others, became a need to implement these competences within lectures and therefore, providing value to the learning/teaching process as a proactive attitude to access the labour market.

With the aim of implementing teaching innovation methods to allow adaptation in curricula changes, it is also requested to redesign the way in which lecturers transmit information; not only considering new technologies but also to increase motivation and interest in their students, to strengthen autonomy and build team work; and ensuring the learning process of all topics included in the course.

Gamification of learning promotes students' commitment and increases their participation in lectures, allowing almost daily review of subjects (García Lázaro & Kanyinda Malu, 2018). In addition, when gamification is used as a complementary tool to traditional teaching methods, it is not only a way of educational innovation; but also an attractive way of learning, because lecture and student are the core elements of the game experience.

Gamification comes from the English term *the game*, but far from a simple concept of game, it implies the use of game dynamics and structure within non-ludic environments (Deterding, Dixon, Khaled, & Nacke, 2011; Werbach & Hunter, 2015). It is important to clarify the concept to avoid misunderstanding with that of game or game-based learning (GBL) methodology. In GBL, so called *serious game*, teachers create a game or use one already made for a didactic purpose. Teaching through games can be an attractive experience for both lecturer and student, but to do that, it is requested from the lecturer to make an effort on designing the activity with well clearly defined goals, avoiding misunderstanding between GBL or *serious game* and gamification (Cortizo et al., 2011).

Hattie (2012) refers to teacher feedback as one of the most relevant aspects in learning (Hattie & Timperley, 2007), as well as the relationships between student and lecture (Hattie, 2003). This relation determines the individual engagement of each student in the classroom. The challenge and expectations for both, student and lecturer are part of a meaningful learning process, as one of the neuroscience principles. These four characteristics are included in a total of 19 aspects studied by Hattie's meta-analysis on a sample of 80 million students, analysing 800 items and providing more than 50,000 studies (Hattie, 2008). He concluded that to become a successful teacher, he or she needs to self-evaluate the way of teaching, to provide appropriate challenges for students and to create a positive learning atmosphere within the classroom, among other factors.

Rodríguez & Santiago (2015) summarized in 10 items the reasons why gamification is beneficial, being motivation on top of the list; and including also immediate feedback, one of Hattie's factors. If neurodidactic principles from neuroscience are considered, when a student

is motivated, a neurotransmitter called dopamine is activated (Paniagua, 2013), known as brain's fuel, which allows the individual to focus, increasing the interest for the activity he/she is involved in.

In formal education, there are several experiences (Domínguez & Antequera, 2012) that empirically show that the use of games in classrooms with the aim of teaching and learning subjects included in core curricula (Bermejo et al., 2019) promotes learning and improves academic results in students (López Raventós, 2016; Rodríguez Parra, Bermejo Palomares & García Lázaro, 2019). However, there is a lack of studies in undergraduate education (Da Silva et al., 2017; Sousa, Jurdi & Silva, 2015), especially in degrees of the health area (Perrier Melo et al., 2016).

Bearing in mind all the above, it was considered to design a gamification experience applying an “escape room” exercise as a learning method. It was intended that students got immediate feedback as they move on different proposed activities, activating their reward system.

Background

Occupational therapy is a client-centred health profession concerned with promoting health and well-being through occupation (WFOT, World Federation of Occupational Therapists, 2012). In the neurological fieldwork, several approaches and techniques are used by occupational therapists, such as constrain induced movement therapy (Wolf et al., 2006), Affolter therapy (Affolter, 1981), Bobath concept (Bobath & Köng, 1976), proprioceptive neuromuscular facilitation (PNF), (Viel, 1989), Perfetti method (Perfetti, Ghedina & Hernández, 1999), among others.

At Universidad Rey Juan Carlos, within the occupational therapy bachelor's degree, students are trained in the knowledge and skills to implement all these therapeutic approaches in their professional career, as well as to apply to fieldwork education, through the use of traditional lecture-based teaching with teaching-centred approach.

To implement the study, a subject named Occupational therapy methods II was chosen from the programme, which seeks to train students in different approaches such as Bobath, Perfetti, Affolter, sensory integration, communication disorders approach and myofunctional therapy, Snoezelen multisensory environments, relaxation techniques, cognitive stimulation or PNF. All of these are implemented in clinical practice with the appropriate population (pediatrics, neurological conditions, geriatrics, mental health...).

The subject is part of the third year, second semester course (January-May), and consists of 6 ECTS credits (4 practical and 2 theoretical). Students weekly fulfill 2 hours of theory lecture-based teaching plus 3 hours of practice where they have the chance to role-play and put in practice the applied knowledge, first among them and later through a simulated clinical case. The goal is to enable them to apply the method in clinical practice.

In previous academic years, to get the required skills for the method, the 3 hours practice of Perfetti method included first a demonstration by the lecturer on how to use the technique and second, a role-playing among students divided in couples (one student as a patient and the other as a therapist and vice versa). Then, each couple of students had to apply their knowledge and skills in clinical cases proposed by the lecturer. As part of the subject, students also had to make an assignment and oral presentation on one of the different techniques or approaches included in the programme, receiving feedback afterwards.

Using this methodology, academic results were generally good. However, lecturers found that students chose the method for their assignment with the only purpose of simply pass the course. In order to avoid this apparent lack of motivation for the learning process and knowledge of the rest of the methods, some topics of the curriculum were redesigned. Among others, an escape room exercise was incorporated as an innovative pedagogic tool in the health area of education to raise and encourage student interest to learn new skills and knowledge for their professional future as occupational therapists.

The general aim was to include gamification techniques in the training of future occupational therapists as a pilot study; and here we present particularly the use of an escape room exercise in one of the degree courses, to evaluate the effect of such tools on learning of health area students.

Method

50 students took part of the experience. They were divided in three groups, and then each group was divided in 4 smaller groups of 4-5 students. All small groups were provided with the same material for the escape room aiming to solve the enigma.

The purpose of the escape room experience was to review and consolidate the practical knowledge of the Perfetti method as part of the subject. To do so, the lecturer proposed a clinical case, including puzzles or riddles in a creative way through the use of clinical reasoning by

health professionals. Students were challenged to solve the problem as efficiently as possible, considering the perspective of the method applied.

Throughout the implementation of the escape room experience as a gamification technique, all students had to learn characteristics of all the methods included in the programme to be able to solve the challenges proposed. As an example of this, it will be now explained in detail how the Perfetti method, also known as cognitive therapeutic exercise (CTE) (Larrad, Rizzello, Perfetti, Panté, & Zernitz, 2012), was implemented in the new design of the curriculum for the mentioned subject Occupational therapy methods II as part of the third year in the occupational therapy bachelor degree at Universidad Rey Juan Carlos (Madrid, Spain).

Procedure:

When using gamification in any curriculum, it is requested to consider the inclusion of elements in the game such as points or rewards, but it is also important to consider that the goal is not developing a full reward system known as PBL (Points, Badgets and Leader Boards). The escape room was developed to work with students in the classroom. With the purpose of building motivation and a sense of team, as part of the game, each group was asked to choose the name of a well-known occupational therapist they felt identified with.

Finally, to complete the research from a qualitative perspective, with the purpose of finding out the level of participant's satisfaction and thus, their acceptance to include this sort of learning techniques, a Google Form design questionnaire was used among students. They could access through their own university online platform, a sort of virtual learning environment where they can find all sorts of Web-based information for the different courses of the programme.

The questionnaire consisted of several questions where participants had to grade their level of satisfaction from 0 (very low) to 10 (very high) with the escape room experience as a learning tool. In addition, they also graded their participation and concepts learning. They were also asked whether they wished an escape room experience being part of the course as an evaluation method, as well as to repeat the experience in other formative contexts. The questionnaire was not fully anonymous as they had to use the therapist's name that identified their work team.

Practice:

To develop the escape room game, the lecturer chose topics that had recently been taught and designed material for the game, such as envelopes with clues and riddles, padlocks and keys, boxes, and paperwork that included clinical cases and CTE (Figures 1 and 2). Participants were

given 10 minutes to solve the puzzles and riddles to escape from the room. From the start, students were provided with different pictures where an occupational therapist was treating a client who suffered a stroke applying Perfetti method, including appropriate material typical for this approach. A stroke patient was chosen due to the original idea of the method development based on motor recovery of the adult hemiplegic. In the theoretical and practical lessons, students were taught how to proceed with the right technique based on the affected motor component. Then, participants had to find out all the riddles: the CTE and their grades, muscle groups, the pathological element of the motor component treated as well as the sensory paths or the sort of CTE proposed by the therapist. Each CTE successfully solved led students to a new puzzle which consisted of another CTE related to Perfetti method. Once they had been able to solve three riddles through consensus of the group, students could find a key which gave them access to a final test through the use of Kahoot! Platform, a free formative assessment tool where they had to answer questions related to the method taught and already put in practice.

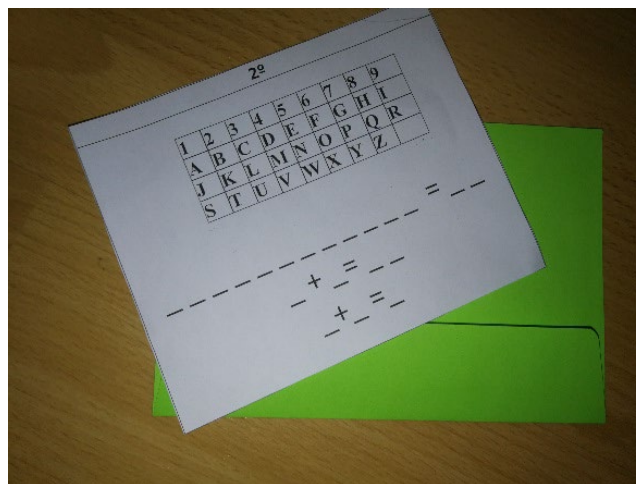


Figure 1. Riddle with muscle groups worked in the CTE proposed



Figure 2. Boxes for each group and envelopes with clinical cases

To promote a positive competition among groups, but also within members of each group, puzzles are meant to be solved only as a team to gain access to certain keys which allow them to get the access codes to use the Kahoot! platform, as part of the final goal of the game. The Kahoot! used consisted of a multiple-choice quiz with questions about the technique theoretical knowledge. There were chosen only two core and clear questions due to the limited amount of time for the escape room.

Kahoot! formative tool provides student an opportunity for instant feedback. It has been described by Karpicke & Blunt (2011) that this sort of tests are better tools to assess learning than conceptual maps. This is the reason why Kahoot! platform was used in the last part of the escape room as part of the game-based learning design.

Results

Despite the fact that students could have previously been involved in an escape room experience outside education, they generally felt that this was a very good innovative method to apply contents. For all of them it was the first time they ever participated in an escape room within the degree and indicated not to have engaged in a similar experience of learning throughout their university training so far. They felt it was a positive experience to gain theoretical knowledge for their learning.

Out of 50 participants, 40 filled in the questionnaire. 90% of participants were female students, a similar percentage than average enrollment for the occupational therapy degree. The majority of students were around 22 years old, except for 22% of them who were older than 24.

Four main issues were addressed in the questionnaire:

First, students were asked to indicate what their opinion was about using an escape room as a learning method in the classroom (being 1 very bad and 10 very good). 62.5% of participants graded their experience as 10; being 9.27 the mean for student satisfaction level.

A second question showed that 65% of participants (mean of 9.37) graded also a 10, considering it a very good method to enhance student's participation within the classroom.

Third, a score of 10 was given by 55% of participants to acknowledge that an escape room was very good to help them integrate relevant concepts, being 8.92 the mean for it.

Fourth, whether they would like or not to repeat the escape room experience to reinforce knowledge in the Occupational therapy methods II subject. 97.5% of students answered "yes".

With regard to whether they wished the escape room experience be part of an assessment method in the course, 57.5% answered positively opposite 42.5% who disliked the idea.

Finally, when comparing average academic results in this subject, together with other innovative pedagogic tools, an improvement of 0.66 points was found in the students' marks between those students from the previous 2017/18 year (7.320) with no gamification experience, and the students who participated in the study in 2018/19 year (7.983) following the gamification experience.

Conclusion

The use of an escape room experience applied to Perfetti approach, as part of the occupational therapy bachelor's degree programme, was considered of high value for the majority of students, as well as an appropriate learning method in the classroom.

Most of the students that took part in the escape room experience, would like to repeat to consolidate the course contents as an innovative way of learning.

It might be suggested that the experience of an escape room applied to the teaching-learning process in the health field, specifically in occupational therapy degree, is more motivating than a traditional lecture-based teaching and it could become a good complement to consolidate knowledge within this student profile.

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