STUDIA UBB EDUCATIO ARTIS GYMN., LXVII, 4, 2022, pp. 207-216
(RECOMMENDED CITATION)
DOI:10.24193/subbeag.67(4).49

DIDACTIC ESCAPE ROOM, APPLIED AT UNIVERSITY, IN ONLINE TEACHING

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Received 2022 October 08; Revised 2022 November 21; Accepted 2022 December 05; Available online 2023 March 10; Available print 2023 March 30.

ABSTRACT. The use of active teaching techniques combined with ludic aspects and game-based learning is a current field of investigation in higher education. "The use of escape rooms is also being considered as an educational tool in many schools. Using a variety of scenarios and challenges, the escape rooms create an experience that is simultaneously motivational and educational for the participants" (Manzano et al., 2021, p. 1). Our Didactic Escape Room was applied in the 2020-2021 academic year, at the end of the first semester, during the Covid-19 pandemic period, with online teaching, on a group of students from the Faculty of Physical Education and Sport (FEFS), enrolled at the psycho-pedagogical specialization within the Teacher Training Department, and on a group of students from the Faculty of Psychology and Educational Sciences, specializing in Pedagogy of Primary and Preschool Education (PIPP), within Babeş-Bolyai University, Cluj-Napoca. Through this intervention, we measured the general attractiveness, stimulation and novelty of a didactic Escape Room applied online, and we found that the degree of attractiveness for a didactic Escape Room, applied online, was high. Also, it was stimulating enough to generate engagement at the group level. We believe that the specificity of the group involved in the Escape Room is very important, and that each didactic activity of this kind be properly adapted for the class to which it is applied.

Keywords*: didactic, escape room, class, university, education, online*

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Introduction

The use of active teaching techniques combined with ludic aspects and game-based learning is a current field of investigation in higher education. The use of escape rooms is also being considered as an educational tool in many schools. Manzano et al. (2021, p. 1) declare that "Escape rooms are immersive games played by small groups of three to eight people, in which participants are required to solve puzzles to escape from a room or, in the case of breakout, open a final chest".

Most escape rooms include narrative-based challenges that use puzzles, tasks, and a time limit. Other varieties include puzzle hunts, breakout boxes, escape books, augmented reality escape rooms, and portable escape rooms in boxes, which allow players to enjoy the same immersive and difficult experience in the comfort of their homes (Fotaris & Mastoras, 2019).

The escape rooms provide an experience that is both motivating and educative for the participants by using a variety of scenarios and difficulties. Within an escape room, all problems, challenges or activities are called puzzles. To escape the room, players must solve different puzzles in a certain period, determined by the creator of the room (Nicholson, 2015). Moreover, the thematic experience and the knowledge about the topic, plays a crucial role in the puzzle design process. For a successful experience and for players to be drawn into the game environment, the chosen theme must be consistent with the narrative part of the theme (Clare, 2016).

It shouldn't come as a surprise that educational institutions have begun to include these projects into their curriculum by using escape rooms as teaching tools. Some instructors have taken one step further and created educational escape rooms, which are defined by López-Pernas (2019, p. 1) as "escape rooms that include part of the course materials within their puzzles in such a way that students are required to master these materials in order to solve the puzzles and succeed in the escape room".

Even though the majority of escape rooms are just for entertainment, educational escape rooms are growing in popularity with professional programs as a way to include students in their learning environment and foster teamwork and the development of social skills (Brown, 2019). Complexity is essential to the success of educational escape rooms since overly simple puzzles can quickly bore children while excessively difficult ones may cause frustration or even worry (Hermanns et al., 2018). A resulting design criterion for educational escape rooms is to ensure active participation within teams.

According to the findings of recent studies, games and the utilization of escape rooms have been successful in immersing students in the learning process and aiding in their memory of what they've learned (Veach, 2019).

Also the research called "Escape Rooms for Learning: a Systematic Review", presents a systematic literature review of 68 studies focused on educational escape rooms. Study results indicate that escape rooms help students to understand problems in another ways and were found to promote teamwork and collaboration. The activity of the escape room developed and improved social interactions, which was another shared benefit. Improved analytical skills such as critical thinking, problem-solving and creativity were also signalled as a major advantage (Fotaris & Mastoras, 2019).

Another study demonstrates that an escape game in the classroom encourages students to discover scientific concepts in a group setting and in a playful way. It also offers opportunities for students to develop adaptive and receptive skills, to compete with and against their peers, to display their individual skills, interact with one another, and experience moments of discovery and success (Dietrich, 2018).

Wiemker & Clare (2015, p. 2) says that, "to solve the puzzles, players require skills such as searching, observation, correlation, memorization, (logic) reasoning, mathematics, reading and pattern recognition". Among the abilities that can be developed with the usage of escape rooms in the classroom are problem solving and critical thinking. The various activities and challenges that the escape rooms present encourage participants to consider, assess, and solve problems. According to studies, the majority of participants get motivation and commitment from playful learning experiences (Whitton, 2018).

Another notable finding of one of these studies is that educational escape rooms can aid students in learning from their classmates and gaining a unique outlook on the course topics. The type of riddles employed in educational escape rooms must be extremely dependent on the subject area in light of their prior experiences (Eukel, 2017).

Objectives

1. The level of attractiveness for a didactic Escape Room applied in an online university course.

2. The degree of stimulation and novelty perceived by students of a didactic Escape Room applied in an online university course.

3. The difference in perception, on a didactic Escape Room applied in an online university course, between the moment before and after participating in the Escape Room, for two groups of students from different specializations.

4. The difference in perception, on a didactic Escape Room applied in an online university course, between the moment before and after participating in the Escape Room, between the two groups.

Material and methods

Didactic Escape Room was applied in the 2020-2021 academic year, at the end of the first semester, during the Covid-19 pandemic period, with online teaching, on a group of students from the Faculty of Physical Education and Sport (FEFS), enrolled at the psycho-pedagogical specialization within the Teacher Training Department, and on a group of students from the Faculty of Psychology and Educational Sciences, specializing in Pedagogy of Primary and Preschool Education (PIPP), within Babeș-Bolyai University Cluj-Napoca. None of the students had participated, prior to this class, in any didactic Escape Room, online or onsite.

In order to fulfil the research objectives, the UEQ (User Experience Questionnaire (UEQ), n.d.) was applied, built online with the help of Google Forms.

The research was carried out on the following steps (identical for both groups of students - FEFS and PIPP):

- A presentation was made regarding what an Escape Room and a didactic Escape Room entails;
- An analysis of a didactic Escape Room tutorial, very similar to the one the students were going to participate in, was carried out;
- UEQ was applied, before participating in the Escape Room (UEQ1-FEFS and UEQ1-PIPP);
- The didactic Escape Room took place (FEFS – 10 students, PIPP – 37 students);
- UEQ was applied, after participating in the Escape Room (UEQ2-FEFS and UEQ2-PIPP).

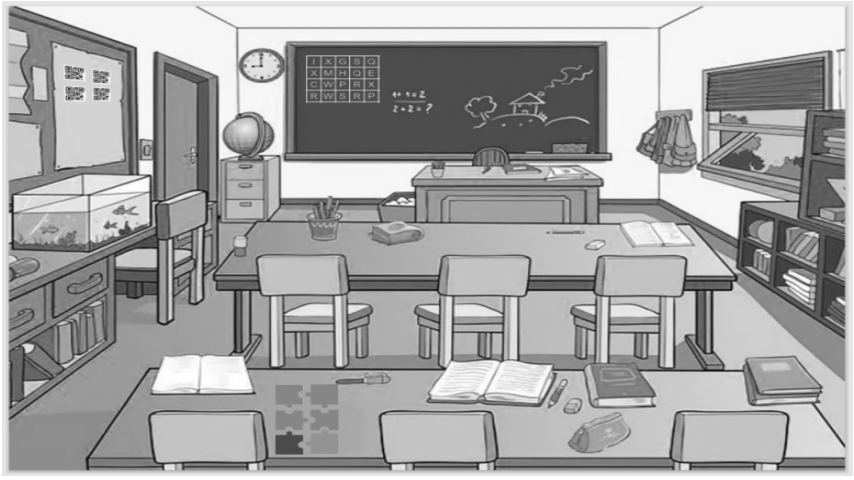

Fig. 1. *Didactic class (Escape Room) with clues*

The structure used for Didactic Escape Room:

- Students received a link that led them to a riddle;
- Solving the riddle opened the "didactic class" in which the clues were located.
- The first 6 clues (key terms from the didactic content) had to be found in a square with letters;
- Each clue was the password for one piece of a puzzle;
- Solving the puzzle offered a mathematical map which, solving it, offered a final number;
- The correct number was linked to a QR code that opened two text fields from the didactic content, which needed to be processed;
- The other QR codes offered an image in which the password for story cubes was hidden.

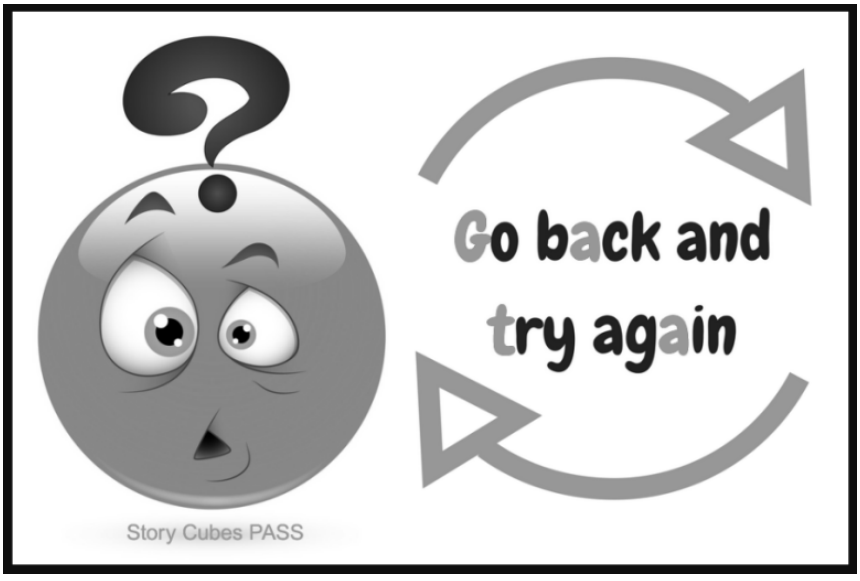

Fig. 2. *QR code for Story Cubes*

Results

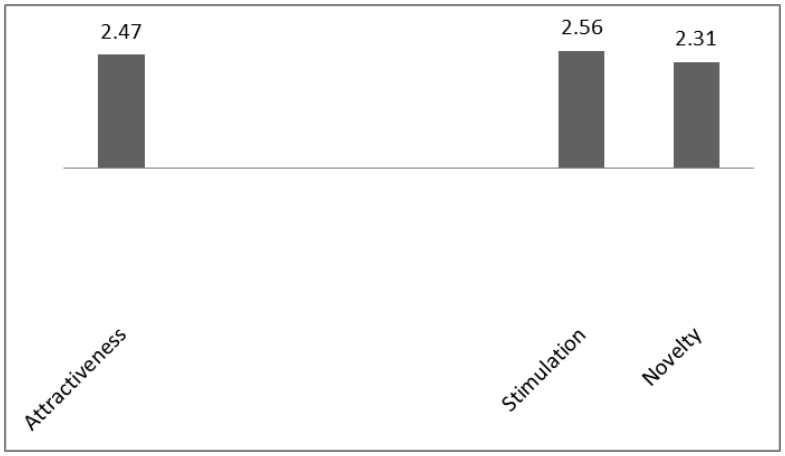

Chart 1. UEQ1-FEFS
Chart 1 shows the initial results for the FEFS group

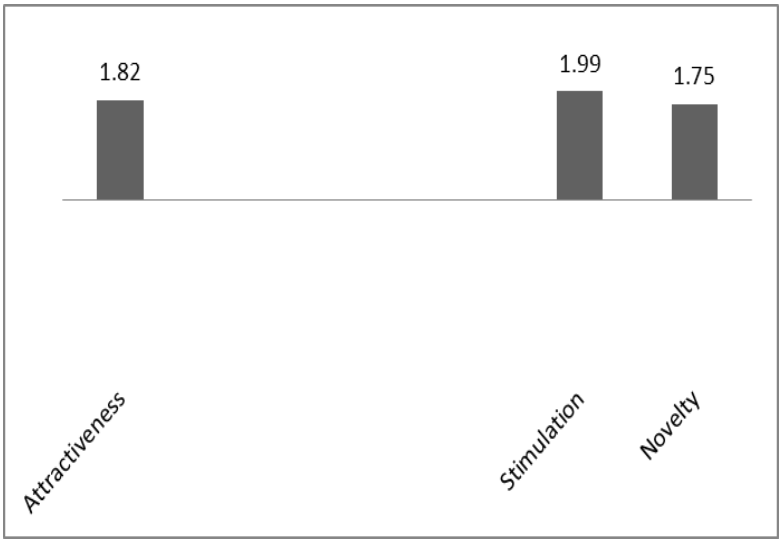

Chart 2. UEQ1-PIPP
Chart 2 shows the initial results for the PIPP group

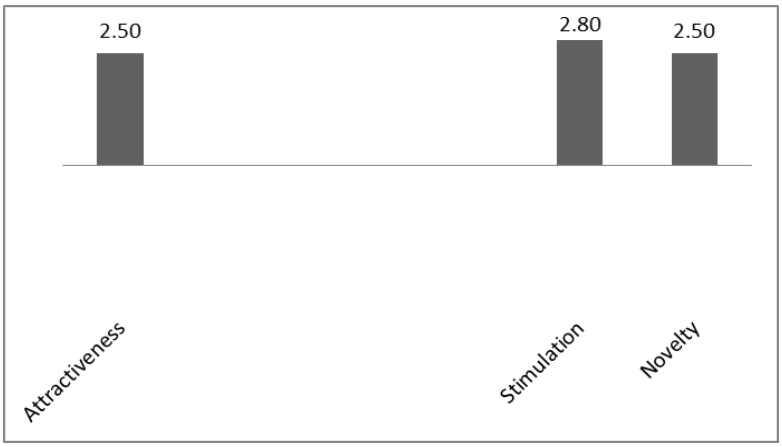

Chart 3. UEQ2-FEFS
Chart 3 shows the final results for the FEFS group

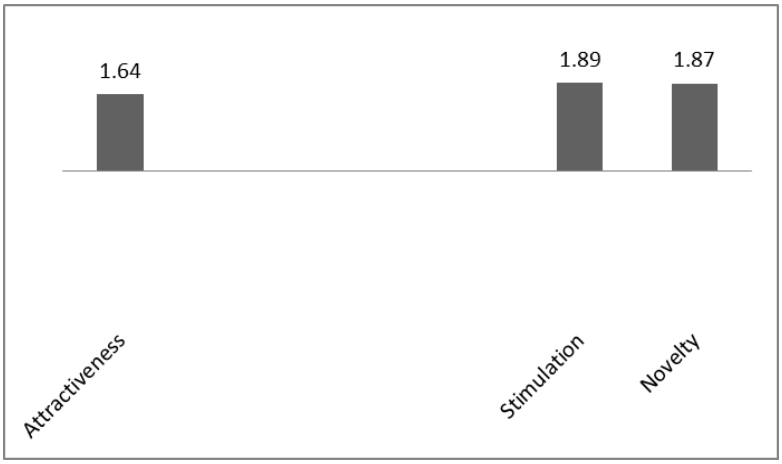

Chart 4. UEQ2-PIPP
Chart 4 shows the final results for the PIPP group

In Table 1 we note that we have no significant differences, p=0.05, before and after Escape Room for the FEFS group.

Table 1. Two sample T-Test UEQ1:UEQ2 (FEFS), Alpha-Level 0.05

Attractiveness	0.6901	No Significant Difference
Stimulation	0.2072	No Significant Difference
Novelty	0.2613	No Significant Difference

In Table 2, we note that we have no significant differences, p=0.05, before and after Escape Room for the PIPP group.

Table 2. Two sample T-Test UEQ1:UEQ2 (PIPP), Alpha-Level 0.05

Attractiveness	0.7162	No Significant Difference
Stimulation	0.8359	No Significant Difference
Novelty	0.7895	No Significant Difference

In Table 3, we notice that we have significant differences between the two groups, for Attractiveness and Stimulation, p=0.05, before and after Escape Room.

Table 3. Two sample T-Test FEFS:PIPP (UEQ1), Alpha-Level 0.05

Attractiveness	0.0013	Significant Difference
Stimulation	0.0034	Significant Difference
Novelty	0.0569	No Significant Difference

In Table 4, we notice that we have significant differences between the two groups, for Attractiveness, Stimulation and Novelty, p=0.05, before and after Escape Room.

Table 4. Two sample T-Test FEFS: PIPP (UEQ2), Alpha-Level 0.05

Attractiveness	0.0022	Significant Difference
Stimulation	0.0013	Significant Difference
Novelty	0.0034	Significant Difference

Discussions

Participation in didactic Escape Room, applied in an online class at university, was evaluated with high scores by both groups on all three dimensions evaluated. Higher scores were obtained in the FEFS group compared to the PIPP group.

For the FEFS group, all scores increased after participating in the Escape Room, but for the PIPP group the score increased only for Novelty, while for Attractiveness and Stimulation lower scores were recorded after participating in the Escape Room. Although there were changes in the scores of the evaluated dimensions, they are not statistically significant at p=0.05. It is possible that

the attractiveness and degree of stimulation, in the PIPP group, may have decreased due to the general perception of the complexity of the proposed Escape Room. Unfortunately, we did not measure this aspect, but we can state, from our records, that in the FEFS group all participating teams completed the didactic requirement, while in the PIPP group only one group was close to this target, in the same time frame. One problem we encountered in this research was the difficulty of effectively controlling the interaction between members of the same team during online activity.

On the other hand, the scores recorded between the groups are statistically significant (p=0.05). Before the Escape Room there were differences between the FEFS group and the PIPP group on Attractiveness and Stimulation, and after the Escape Room, we recorded differences on all 3 dimensions between the two groups.

Conclusions

The degree of attractiveness for this didactic Escape Room, applied online, was high. Also, it was stimulating enough to generate engagement at the group level. We believe that the specificity of the group involved in the Escape Room is very important, and that each didactic activity of this kind be properly adapted for the class to which it is applied.

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