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Escape rooms' pedagogical potential from female future teachers' perspectives

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Abstract

Fast and easy Internet and knowledge access by just a click are some of the characteristics of the twenty first century. This means that this knowledge has been acquired fast and superficially. Thus, discernment turns into something ephemeral, because there is not a profound examination of the aspects dealt with. This is caused by the enormous quantity of information found that, in many cases, does not reflect reality. In this sense, teachers can find multitasking students that can perform many activities but without reflexively undertaking them. Education tries to solve these type of problems so the learning-teaching process is as significant as possible. Therefore, future teachers should always have tools for keeping students' attention, as well as to raise interest in the studied subjects. Within these new tools, escape rooms are, because they not only increase students' motivation but also encourage teamwork and reflexive learning, as the tasks to be solved are complex. However, as male and female present different perspectives towards gamification, in this work, escape rooms have been studied applying a gender perspective. In the University of Seville, Spain, a descriptive-interpretative exploratory study took place intending to analyse future female teachers' conceptions about escape rooms. A 17-item questionnaire was applied to 99 female students of the Degree in Primary Education. Results show that subjects highly valued the ludic part of the escape rooms as a didactic activity, which fosters significant learning. Students also appreciated that the activity was close to their reality and that it was integrating students' interests in the Primary Education classroom. The main conclusion of the study is that, even if there is room for improvement and there is a need to make them more appealing to female students, escape rooms are considered an excellent educative resource as well as an adequate alternative teaching methodology.

Keywords

Educative Tool; Escape Rooms; Pre-Service Female Teachers; Primary Education

Cover Page Footnote

This research project is part of the Innovation Project 'Los Escape rooms y los Breakouts como estrategias didácticas para el abordaje de problemas sociales y ambientales en la formación inicial de los profesionales de la educación', with code 22824, granted by competitive tendering by the Plan Propio de Docencia of the Universidad de Sevilla for the academic year 2019/2020.

Constructivist learning theory is a contemporary approach that places individuals at the centre of the learning process, where they are active participants as well as the main responsible knowledge generation agents (Chen, 2003). To achieve that, which is one of the main challenges for Education in the 21st Century, it is important to attract and maintain students' attention and interest. Education and how it is applied must always consider the global context.

2020 is a year challenged by the COVID-19 pandemics. Many countries have reduced the spread of the SARS-COV-2 virus by establishing lockdowns. Spain is one of them. Consequently, all face-to-face education linked activities were suspended at all levels. Therefore, on-line teaching was adopted as a generalised solution to maintain educational goals. In the current situation, we cannot forget that we are immersed in an increasingly technological environment that influences citizens' daily lives –teachers, students and their families alike – through mass media, Internet and other tools that still need to be incorporated into the classroom reality.

Education professionals are constantly seeking for innovative teaching and learning strategies and tools adapted to the out of the classroom reality. These new ways of working should always incorporate the values and skills that will allow students to develop as future citizens: commitment, teamwork, problem solving abilities, respect and, above all of them, motivation, and interest. Student-centred-learning is paramount for the European Higher Education Area as it is considered to improve the quality of education (Delgado-Martínez, 2019). Thus, when training pre-service teachers, they must be provided with strategies and techniques enabling them to plan educational student-centred activities to train the qualities of future citizens. One of the main goals of the Europe 2020 strategy is for citizens to acquire new skills to enable them to adapt to new conditions and potential changes in their careers (European Commission, 2010). Consequently, the old teacher-centred methodologies, such as traditional lectures or speeches, are moving towards student-centred ones, which certainly increase the possibilities of significant learning (Alkan & Kurt, 1998; Kısakürek, 1996). Examples of them are debates, theatre plays, questions, and answers to direct the session, problem-solving tasks, research projects, observation and participation in didactic itineraries, and gamification.

These new applications of innovative methodologies and strategies that allow experiential learning are significantly increasing their presence in the classrooms. This is illustrated by how those activities related to gamification are becoming more frequent in the classrooms. One of the reasons of the positive integration of ludic aspects in the education sector is that games establish connections between the environment and the players, that is,

they get emotionally involved, they have to communicate, they have to test their previous experience and knowledge to solve tasks, they have fun, they are excited. Another important factor that favours the inclusion of gamification in the classroom is learners' positive attitude towards the transformation of contents into games. Gamification fosters students' motivation and, generally, is perceived as an excellent way of getting feedback during the learning-process (Muntean, 2011). It also generates a positive attitude among students, which has proven to be beneficial for their academic success (Polat, 2014, Gibson et al., 2015), as well as improving their communicative and coordination skills (Korkmaz & Öztürk, 2020). The main difference between games and gamification is that gamification is commonly used to advance gaols outside the game, whereas playing games is considered intrinsically motivated (Koiviso & Hamara, 2014).

Considering all the benefits described in the previous paragraphs, escape rooms can be considered an excellent example gamification activity. In escape rooms a group of people must collaborate if they are to solve different tasks that are presented in order to get attain their final goal and, then, be able to exit the room (Borrego et al., 2016; Eukel et al., 2017). Escape rooms started in Japan in 2007 as a leisure-oriented activity and, later on, they experienced a quick expansion in different European areas (Borrego et al., 2017). Currently, there are plenty of escape rooms businesses in many cities; they represent an alternative ludic way of spending some time with friends or are used as an innovative manner for team building. Therefore, escape rooms are excellent educational tools because they not only make the learning process fun and pleasant, but they also favour the elimination of factors that complicate or hinder a significant learning process (Prensky, 2002; Bayat, Kılıçarslan & Şentürk, 2014).

Moreover, many facts indicate that escape rooms are becoming very popular in education. One of them is the creation of different specialised sites in Spain (educaperom, escuela de experiencias, educación 3.0). Many educators perceive escape rooms as optimal teaching resources as they force participants to work in teams and to test their skills, knowledge and abilities to attain a final common goal. Simultaneously, they make students commitment to their own learning increase and foster they motivation (Borrego et al., 2016; Eukel et al., 2017; Nebot & Campos, 2017).

Although it may be presumed that escape rooms are more suitable for primary or Secondary Education, they are considered attractive for many adults and that makes it perfect for higher education (López-Pernas et al., 2019). In this line, educators have shared plenty of didactic experiences examples of the pedagogical use of escape rooms; some of them contain detailed instructions so they can be replicated. One of them was developed by Borrego et al.

(2016), who implemented an escape room with higher education students of the Degree in Computer Engineering aiming to learn computation contents. In another one, a group of Pharmacy students used escape rooms to study diabetes management (Eukel et al., 2007). Both are successful examples of the use of escape rooms in higher education environments.

In general lines, it can be stated that the introduction of ludic experiences in the classroom is highly beneficial for students. There is a sum up of their main benefits: contents are presented originally and attractively; teamwork and collaboration are fostered, students learn how to solve problems or to delegate them to others; individual and group communication skills are booted; logical thinking and deductive reasoning are incremented; decision making and autonomy are practiced, and finally, the capacity to acquire a global vision is trained, as students need reflect about the problem they have to solve. As stated by Sierra-Daza and Fernández-Sánchez (2019), escape rooms are very effective when transferring elements and learning methodologies using games, promoting the assimilation of complex concepts belonging to different areas of knowledge (Ke, 2014; Borrego et al., 2017; Pérez-Manzano & Almela-Baeza, 2018).

Nonetheless, several authors indicated that the process of decision-making presents differences between male and female individuals (Venkatesh & Morris, 2000) and, in this way, they process information (Sung and Zhan, 2006). In the same line, previous research has established that, in general men display more instrumental behaviour and are more task-and-achievement-oriented, whereas women are more interpersonally-oriented (Hoffman, 1972; Minton & Schneider, 1980). In the case of mobile learning, a study stated that women were influenced by social factors (Wang et al., 2009). Also, men have been noted to express more achievement-oriented motivations (Williams et al., 2009), and more competitiveness and need for winning than women do (Hartmann & Klimmt, 2006).

There is reason to believe that because gamification incudes hedonic and utilitarian motivation, gender differences exist in gamification (Codish & Ravid, 2017). Results are contradictory as recent studies regarding gender differences showed that women were less motivated by games (Eickhoff et al., 2012; Pedro et al., 2017), and other studies found that female users considered gamified experiences more playful than male users (Koivisto & Hamari, 2014).

While the existing information provided by research is focused on the benefits of gamification, many questions regarding how demographic characteristics influence its perception and effects are still unanswered. Existing research consistently shows that gender differences exists in motivations for playing games and game genre preferences and the

emotions experienced during the games (Codish & Ravid, 2017).

The current body of literature on the use of escape rooms in education suggest that there is no difference between men and women. However, it has been shown that women are more attracted to games that involve a long-term relationship building and ease of use (Yee, 2006; Nakamura & Wirman, 2005) and normally women's decisions to use a system are based on social norms (Venkatesh, Morris, & Ackerman, 2000).

This paper studies future female teachers' perceptions on escape room as a pedagogical strategy because, as future educators, it is important for them to be able to create an escape room appealing to both genders. And as future didactic escape rooms educators, teachers should be aware that female users generally are less likely to be motivated by leader boards and points as a means of competition. The results of designing gamification in such a way that it motivates a specific gender carry the risk of gender discrimination (Codish & Ravid, 2017).

Demographic differences in adoption and use of escape rooms and the effects of using this strategy have not received great attention form the academia. In this paper a gender perspective is provided because teaching is traditionally considered a female profession and, in the case of Spain, most undergraduate and therefore, future teachers, are women. In the case of gamification this is particularly interesting as in many research studies, women represent a minority of the sample. Therefore, this paper provides and insight on the combination of gaming, a traditionally male-oriented activity, and teaching, studies traditionally undertaken by women and considered a female profession.

The aim of this work is to examine the perceptions among female future primary education teachers of the introduction of escape rooms as pedagogical tools to design and create didactic resources with the objective of increasing students' motivation and implication. Consequently, this paper tries to address the following research questions:

1) Are future female teachers familiarised with escape rooms? Are they users of escape rooms?
2) What are future female teachers' opinions regarding escape rooms in terms of their emotional and intellectual perceptions?
3) Do future female teachers consider escape rooms an adequate pedagogical tool?

Methods

The method used is descriptive-interpretative exploratory study (Bisquerra, 2008; Buendia-Eisman, 1992). The choice of the methodology is suited to the descriptive nature of the

research questions and the aims of the study. A 17-item questionnaire designed *ad hoc* was applied. Its primary aim was exploring the potential use of escape rooms in primary education from the perspective of future female teachers. Very little is currently known about female future teachers' views and beliefs on the application of escape rooms in primary education and this study aims to analyse their conceptions. Results would be useful to direct future teacher training towards gender-balanced and student-centred alternative methodologies.

Data collection

Data were collected using a questionnaire specifically created for examining teachers' beliefs on escape rooms as a didactic tool. The scale was a 17-item questionnaire called *EduEscape* designed by the research team and three experts validated it. The first 5 items were designed to get social and demographic data. The rest of the items were designed to explore participants' beliefs and ideas regarding escape rooms and their perceptions about how to adapt them to educational settings.

Questionnaires' administration was always carried out and supervised by a member of the research team. They were administered during the lessons with the approval of the responsible lecturer. It took approximately one hour to complete the administration of the questionnaire. During the first 15 minutes participants could ask questions about the measurement instrument or the procedure. The rest of the time was devoted to finish the questionnaire. Subjects normally spent from 30 to 45 minutes to complete the assigned task. The obtained data were normalised and the statistical analysis was performed using SPSS software (version 25).

Sample

The sample consisted of 99 participants who were recruited from the third-year of the Degree in primary education of the University of Seville. All the participants were aged between 19 and 26 at the time the study was conducted. The study was developed during the 2019. All participants were duly informed on the nature of the research project. Data were anonymous and were only to be used for research proposes.

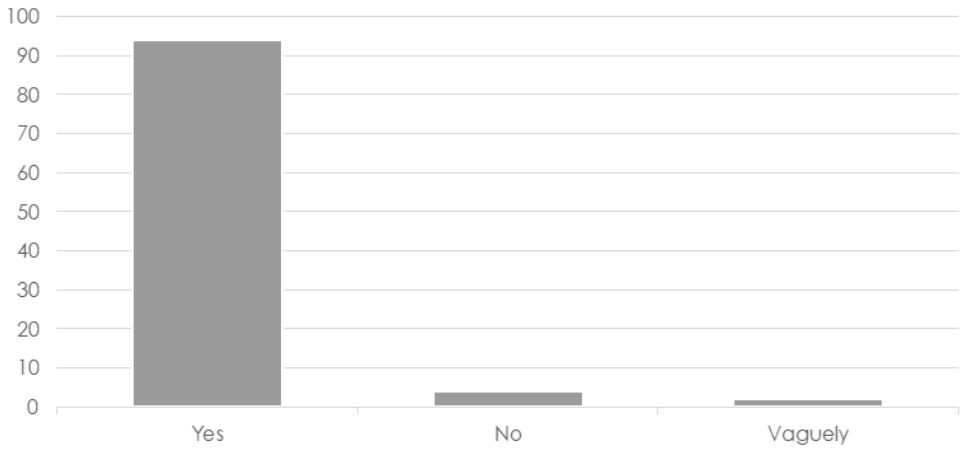
Results

Statistical analyses on the demographic data were performed and results showed that participants were aged between 19 and 26. It must be highlighted that a significant number, 66 percent of the total, were aged 20 and only an 11 percent were more than 22. As shown in Figure 1, when asked if they knew what an escape room was, 94 percent of the subjects state that they did, 4 percent were unaware of the concept, and 2 percent of the subject stated that

the had a vague idea.

Figure 1.

Do you know what an escape room is?



The table below covers the answers of future female teachers when asked if they had previously participated in an escape room. 43 percent stated that they had (while performing volunteering activities, as a leisure activity, in an educational centre, among other occasions); and, 56 percent stated that they had not been into an escape room before (Table 1). Data showed that even if nearly all the participants were familiarised with the concept of escape rooms less than half of them had participated in one.

Table 1.

Have you ever participated in an escape room?

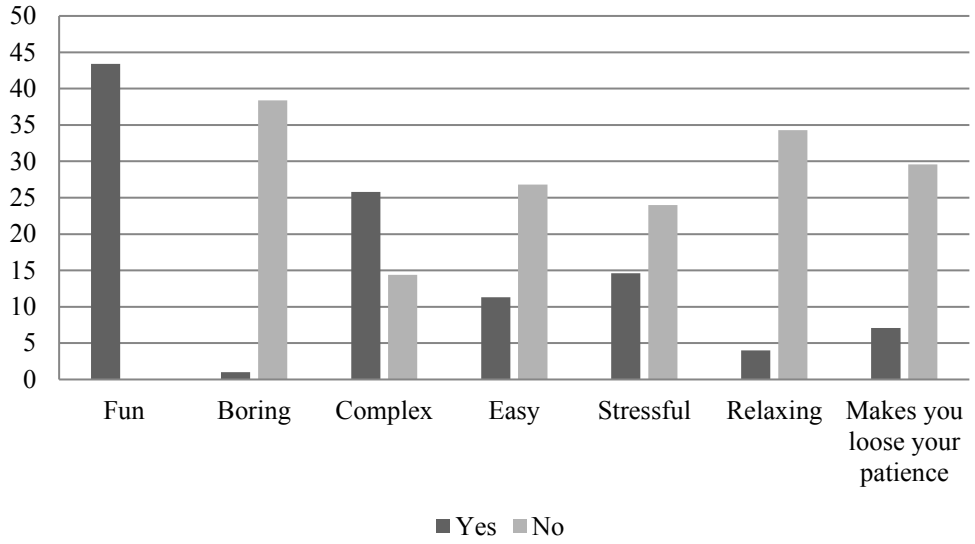
	Frequency	**Percentage**
No, never	56	56.1
Yes, while working as a volunteer	1	1.0
Yes, as a leisure activity, with family or friends	30	30.3
Yes, I have participated in an educational escape room that took place in an educative centre (formal Education).	12	12.1

Subjects that had participated in an escape room were asked to indicate the emotions

they felt when confronted with this kind of experience. As indicated in the Figure 2, the most rated experiences, from both negative and positive answers, were the following: it is a fun activity (43.3%), that is not boring (38.4%), that is not a relaxing activity (34.3%), that does not make you lose your patience (29.6%), that is not easy (26.8%), that is a complex activity (25.8%), that is not stressing (24%). However, it is interesting to notice that 14.6 percent of female future teachers considered escape rooms a stressful activity and that 26.8 percent defined it as being difficult.

Figure 2.

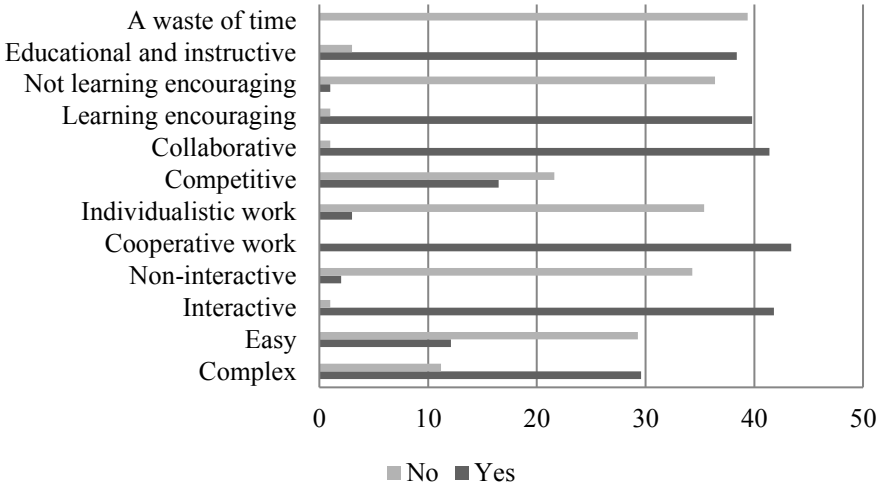
If you answered yes to the previous question, please, mark those options that describe your emotions when participating in an escape room.



Those that had participated in an escape room were asked to define their intellectual experience. Positive and negative responses are ordered according to the percentage of answers obtained (Figure 3). Nearly half of the participants stated that is was an experience linked to cooperative working (43.3%). Also, it was defined as a collaborative (41.4%) and learning improving one (39.8%). 39.4 percent of the participants did not consider escape rooms as a waste of time and 38.4 percent of them classified them as educational and instructive activities. 36.4 percent of the participants reported that escape rooms do not hamper learning and 35.4 percent that they are not an individualistic task. Just over one third of the participants (34.3%) denied that escape rooms were not interactive. Finally, some of them highlighted that they were a complex (29.6%), not easy (29.3%) and competitive (21.6%) type of activity.

Figure 3.

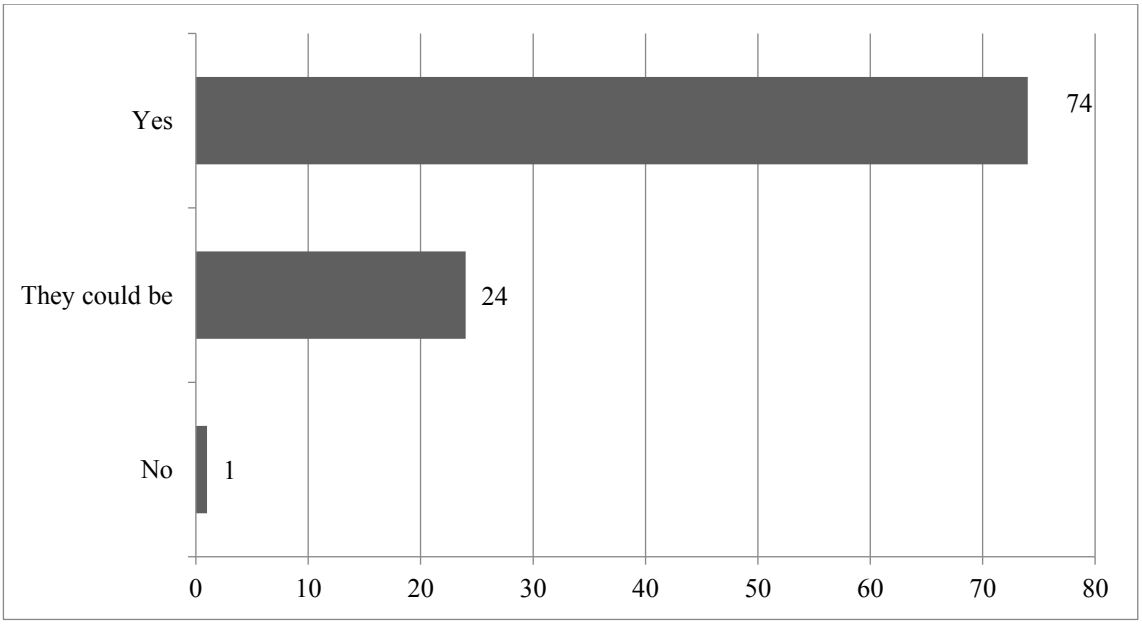
If you answered yes to the previous question, please, mark those options that describe your intellectual experience when participating in an escape room.



A common view amongst participants was that escape rooms were good learning resources (75%). 24 percent of the subjects stated that they could be good learning resources and only 1 percent of the subjects considered that escape rooms were not a good didactic resource (Figure 4).

Figure 4.

Do you think escape rooms are a good teaching resource?

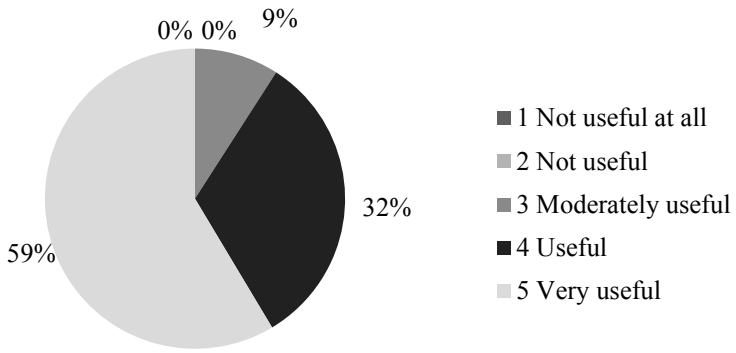


When asked to indicate weather escape rooms could generate significant knowledge included in the school syllabus, subjects' answers were very positive. 81 percent of the

subjects answered yes and 19 percent maybe. Turning into the perceived utility of escape rooms as a learning methodology, answers were obtained using a 5-point Likert-scale ranging from 1 ‘Not useful at all’ to 5 ‘Very useful’. Positive answers represent 91 percent of the responses. As shown in Figure 5, the highest reached percentage was obtained for 5 ‘Very useful’ (59%), followed by option 4 ‘Useful’ (32%) and option 3 ‘Moderately useful’ (9%).

Figure 5.

Do you believe it is useful for future female teachers to get familiarised with escape rooms as an alternative pedagogical methodology?



The next section of the questionnaire was concerned with the future teachers’ beliefs about the reaction of primary education students. Subjects though that students would react by: having fun (100%), not getting bored (100%); enjoying it (99%); in an antagonistic way (89.8%); euphorically (87.9%); not losing their patience (82.8%); not getting relaxed (67%); and not getting stressed (59.6%) (Figure 6).

Figure 6.

How do you think students will emotionally react when in an educational escape room?

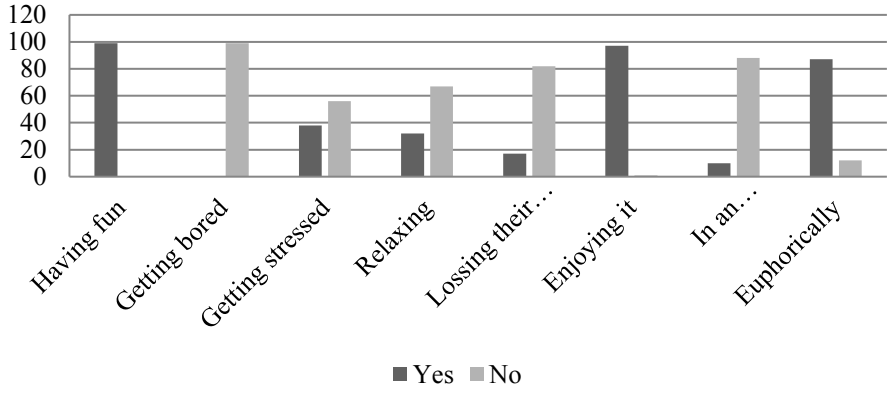


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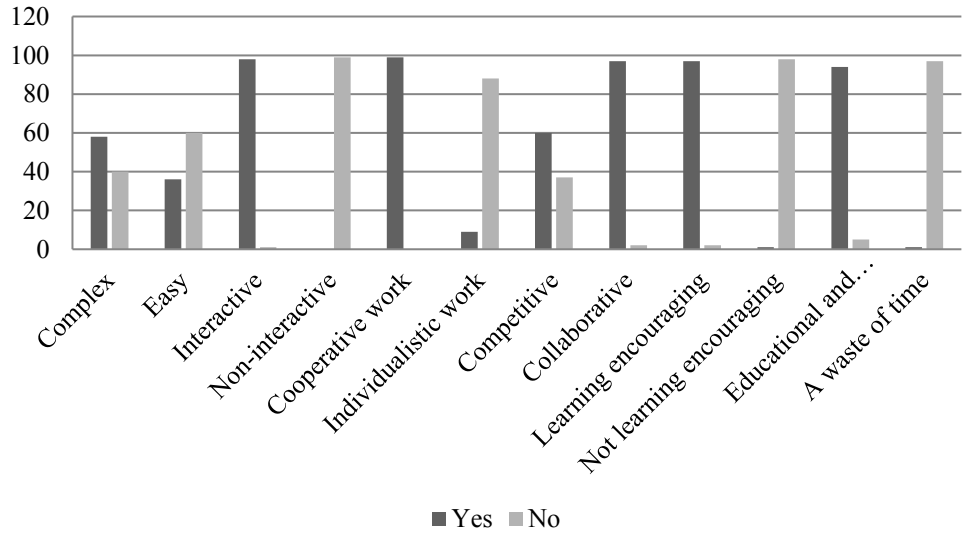
Figure 7.

How do you think primary education students will perceive escape rooms as a pedagogical tool?



Subjects were asked about their opinion regarding primary education students' perception of escape rooms at an intellectual level. All subjects answered that it was going to be perceived as a cooperative working booster (100%) and that was not going to be perceived as not interactive (100%), actually, it was specifically described as interactive by 99 percent of the participants. Subjects were also contrary to the statement that escape rooms do not foster learning (98%). Participants considered that they should be used as a learning-fostering pedagogical tool (98%). Subjects did not consider it a waste of time (99%); on the contrary, they considered it a collaborative (98%), educational and instructive activity (94.9%) and not one promoting individualistic work (90.7%). It was described as an activity which is not perceived as easy (62.5%), that is competitive (61.9%), and that is complex (59.2%) (Figure 7).

Discussion

The adaptation of role game or challenging ones as an alternative pedagogical methodologies as well as their incorporation into the didactic procedures developed for primary education is an innovative approach that provides future teachers with new competences and teaching strategies This work analyses preconceptions and ideas of female students of the Degree in primary education regarding the use of escape rooms as pedagogical resource. The questionnaire was completed by a total of 99 female future teachers, who volunteered to do so. As expected, the mode of the explored sample's age is 20. As it has been mentioned, escape

rooms could, in principle, thought to be more suitable for lower levels, but successful practices in higher education have confirmed that is an optimal methodology for university students.

Results revealed that most participants were familiarised with escape rooms, however, less than half of them had participated in one of them. These data can be interpreted as a lack of appeal for women and is consistent with studies affirming that gamification is more competition and achievement-oriented and, consequently, more interesting and attractive to male than to female (Williams et al., 2009; Hartmann & Klimmt, 2006).

Those students that had previously taken part in an escape room did it as a leisure activity with their family and friends. Therefore, the usual context participants related to escape rooms was not educational or formal one. Most of the subjects considered that the experience was fun and enhanced cooperation and improved the capacity for complex-solving tasks among other skills. So, even if female future teachers are familiarised with escape rooms, only a bit less than half of them use them, and when they do, it is as a leisure activity and not linked to education.

One of the aspects explored was the effect that the use of escape rooms as pedagogical tool produced on emotions. Many future female teachers though escape rooms to be fun, which complies with the main principle of gamification. Results show that it was perceived as an activity that is not relaxing but that provokes a certain degree of stress, that is, an activity that creates the adequate state of alertness that allows participants to get involved in the activity as a team. It must also be noted that approximately a quarter of the sample considered escape rooms complex, and nearly 15 percent considered it stressful and some participants stated that escape rooms made them loose their patience. Even if the literature in the field proved differently, escape rooms in education are generally designed without considering differences between men and women. As the design of the game is another determining factor in its effectiveness for learning (Cooney & Darcy, 2020), a new more gender-fair perspective including those features that research has identified as more appealing to women could reduce the negative perceptions among future female teachers.

When analysed as an intellectual experience, participants stated that escape rooms are a complex challenge, and a certain degree of competition is needed to solve them. However, they are focused on collaborative work and improve learning. Results, which are consistent with Sierra-Daza and Fernández-Sánchez (2019), and reflect that there is a sense of having fun and motivation, as well as a certain degree of excitement for being able to solve the problem. Another important finding, consistent with the analysed literature, was that the use of escape rooms in the classroom helped the promotion of communicative skills, problem solving

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abilities and critical reasoning. According to Venkatesh et al. (2000), Nakamura and Wirman, (2005) and Yee (2006) these competences are favoured by women, so in this sense, escape rooms are fostering and undertaking women's preferences into account.

The investigation has shown that female future teachers of primary education consider escape room an optimal pedagogical resource that can be perfectly used as an alternative learning methodology. Surprisingly, results regarding their own perception regarding the utility of escape rooms in their own teaching and learning process are not as positives as the ones referring to what they think primary students' perception will be. Generally, it can be understood that participants have a positive attitude towards the use of escape rooms in formal educational settings. They also showed high expectations towards the application of escape rooms for the achievement of significant learning.

As stated before, one of the aims of this paper is to explore future female teachers' perspective on the pedagogical use of escape rooms. Results lead to the need to raise awareness on the lack of new student-centred methodologies equally appealing to both genders. In the case of teaching, which has traditionally been a female profession, the necessity of creating a methodology appealing to male and female students is even more excruciating, because if future teachers, who are mostly women, are not involved and motivated by the use of escape rooms they will not undertake that methodology in their future teaching practice.

Limitations and future research

The present study has several limitations and possible future directions. Firstly, it should be acknowledged that self-reported based measure instruments undertaken by students are always problematic, as the answers provided by the subjects can present many biases. However, subjects participated voluntarily and were aware that their responses were anonymous. Secondly, the present study assessed self-reported and not actual behaviour. However, as participants have been exposed to a previous escape room experience and have had to design one, they are aware of their own behaviour when faced to a competitive or collaborative educational environment. Future research should be conducted using actual behaviour and applying a different methodology.

It is important to note that while the findings here suggest that escape rooms are a good methodology to motivate and implicate students into the teaching and learning process, there is room for improvement. With the implementation of escape rooms in further education, many directions for further research should be considered. Future studies should be performed to explore the differences between men and women by undertaking the same methodology and

comparing data. In the same way, future research is required to execute similar escape room experiences for other education level teachers and to undertake different methodologies, such as focus groups or different data collection techniques.

During the implementation of the harder measures to prevent the spread of the COVID-19 disease, from mid-March 2020 until the end of the academic year, on-line teaching was practically compulsory for teachers in Spain. To be able to confront similar situations in the future, further research on how to adapt face-to-face escape rooms to a telematic version should be explored.

Conclusion

The adaptation of role games or challenging ones as an alternative pedagogical methodology as well as their incorporation into the didactic procedures developed for Primary Education is an innovative approach that provides future teachers with new competences and teaching strategies. The study contributes to the literature of the didactic use of escape rooms by examining the perception of women when confronted to a gamified context. However, contrary to several studies performed on gender and gamification, the use of escape rooms in didactic contexts suggests that there are no differences between men and women perceptions and motivations. If escape rooms are to be integrated in the twenty first Century classroom as innovative and student-centred methodologies and to follow the European 2020 strategy; designers, i.e., future teachers should be aware that they are normally more appealing to mean and try to balance them to equally attractive to male and female students.

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No potential conflict of interest was reported by the authors.

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