Escape Room in Pre-School Education Learning

Rocío Patiño Fernández, Universidad Tecnológica Indoamérica, Ecuador
Samary Guillen, Universidad Tecnológica Indoamérica, Ecuador
Erika Pazmino, Universidad Tecnológica Indoamérica, Ecuador

The Barcelona Conference on Education 2022
Official Conference Proceedings

Abstract
This paper analyzes the use of ICT in education, which is demanding in the new generations, who must be involved from an early age. To this is added a virtualized education, due to the pandemic by Covid-19. For these reasons, this research aims to demonstrate that the Escape Room can be used as an effective strategy to bring early childhood education children closer to the use of ICT and the acquisition of meaningful learning, enriching educational opportunities. For this purpose, the quantitative approach and the literature research modality were considered, for the theoretical support of the two research variables; the descriptive and field to obtain data through the survey technique with its respective instrument that allowed the understanding of the problem and provide answers to the research questions. According to the data obtained, it is concluded that the implementation of the Escape Room is highly viable, since the teachers in training show interest, have knowledge of what the Initial Curriculum establishes and carry out activities (challenges) physically, which constitutes a strength to take these aspects to the virtual environment, so that the activities that are proposed in the Escape Room would strengthen it. Based on the criteria expressed by the experts and training teachers at the validation of the proposal, the viability of the proposal is established, which, in addition to being an innovative strategy, is considered a necessary alternative to be used in current virtual education.

Keywords: Learning and Development Areas, Escape Room, Initial Level, ICT

iafor
The International Academic Forum
www.iafor.org

Introduction

For this study, teaching in digital environments was considered as a research line, because it was intended to contribute to the improvement of educational quality at the initial level to generate more meaningful learning, considering that infants today are digital natives. A recent study, IPSO, 2011 [1] "has found that the age of three years constitutes a milestone in the use of technology, at which many children get rid of many of their non-digital toys". This shows that the early years are the most appropriate ages to approach technology. This research considered the use of the digital Escape Room as an innovative educational product that allows this approach of infants and educators to the new reality of virtualized education that was implemented by the pandemic.

This research work is based on the norms and regulations related to education: such as what is established by the United Nations Organization (2015) [2], in the "2030 Agenda on Sustainable Development", where it mentions: "It is urgent that children, youth and adults acquire throughout life the flexible skills and competencies needed to live and work in a safer, sustainable, interdependent, knowledge-based and technology-driven world".

Harnessing innovation and ICTs is essential for strengthening education systems, disseminating knowledge, providing access to information, promoting the quality and effectiveness of learning, and providing services more effectively. In addition, it was based on what was established by the National Secretariat for Planning and Development [Senplades] (2017) [3] in the "National Development Plan 2017 -2021 -A lifetime" in Axis 1: Rights for All Throughout Life mentions: "Education is the basis for the development of society (...). In this sense, it is necessary to find the differentiated impacts of illiteracy, such as showing the high incidence of this problem in adult women, especially in the indigenous population".

In this context, access to initial education is another critical area for children's development. In 2016, 44.6% of children under five participated in early childhood programs-public and private, so the important challenge is to improve the quality of this level of education, as well as access and significantly expand coverage.

In accordance with the foregoing, this work is expressed and developed in which the Escape Room is proposed as a new didactic strategy in Initial Education, where the incorporation of ICT as part of the structure of a class is given priority, innovation, creativity, and the attention it demands to generate new knowledge. This strategy also focuses on gamification, which has been an activity previously used at different educational levels.

Theoretical Framework

Extensive research has been done on the subject and its references in the different digital repositories, as well as in indexed journals and other university or educational repositories. This research has provided information about the use of the Escape Room in education, particularly in the field of gamification, those which helped develop this research. Regarding the use of the Escape Room as an aid for the learning process in Ecuador and Latin America, no specific research on this topic was found, in fact the information that was used originated in several European countries, this background helped the research; however, as the sociocultural, educational and technological context is different from continent to continent, the theoretical postulates of European research and the learning development, which is one of

the variables of the study, were taken into account to provide a general contextual framework on this topic.

Given the above, we found that contributions about the use of the Escape Room in education are important for this study. According to García (2019) [4] in the article "Escape Room as a gamification proposal in education" gamification is a learning methodology that should be indispensable in the pedagogical training of future teachers, which states that these gamification experiences and the use of ICT can be carried out in early childhood education classrooms, which would help students to have meaningful learning. The Escape Room is a resource that promotes creativity, imagination, logical thinking, and deductive reasoning. Which can undoubtedly contribute to research since its purpose is to improve the teaching-learning process. According to the vision of Caridad and Fernandez and Sanchez (2019) [5] in their article Gamifying the university classroom. "Analysis of an Escape Room experience in higher education" shows how the Escape Room can be applied to the learning process and they state that the Escape Room can promote different emotion types in students, such as: fun, motivation, and anxiety, during the resolution of the proposed enigma, these emotions allowed, that the students who performed this Escape Room test, managed to learn an unknown topic. This learning process was facilitated due to the immersion in collaborative work and the joint search for information on phones and tablets, also highlighting the value of the students' predisposition to learning mediated by mobile technologies.

The importance of the Escape Room is highlighted in the paper presented by Castro-Garcia (2019) [6] where it is shown that the Escape Room is a relevant teaching method for the learning process, and indicates that it is possible to apply this methodology and emphasizes that for the Escape Room to work as an educational process it is necessary to know the type of students to whom it is addressed and the type of reward that is obtained by achieving the objective. He also concludes that the puzzles and problems proposed during the development of the Escape Room should be designed taking into account the theoretical classes of a subject.

Muñoz (2020) [7] also contributes to the subject in the article "Gamified Virtual Learning Environment for the Ecuadorian curriculum" evidencing that, by using a technological resource with game characteristics, higher levels of academic performance can be demonstrated and recognizing that gamification is a trend that achieves active processes whose main objective is to improve the learning process.

Theoretical development of the object and field

Gamification

The implementation of the Escape Room within education is based on some principles developed by gamification, in fact, this methodology "Today, it is a very valuable tool in the classroom and, over time, will be a fundamental tool to foster innovation in the educational context" (Garcia Lázaro, 2019, p. 73) [8].

To understand gamification, an idea by Llorens et al. (2016) [9] read in a publication by García (2019) [10] was considered where it mentions that gamification is "the use of strategies, models, dynamics, mechanics and typical elements of games in contexts outside of them". This concept of gamification was applied to the educational Escape Room as an innovative teaching - learning strategy.

Cortizo 2011 [11] points out the benefits of gamification in university students: it rewards the effort, punishes the lack of interest, informs about the involvement of each student and suggests procedures to improve the grade of the subject. On the other hand, Werbach and Hunter 2012 [12] analyze the use of gamification and justify it through the active involvement of the student when performing a task (engagement), second, states that the student works constantly over time (experimentation) and finally positive results (results).

Learning neurophysiology

Once what learning means has been theorized, it is also necessary to understand its biological basis. (Ormrod, 2015, p. 22) [13] mentions that "many aspects of our daily functioning, such as attention, memory, learning or motor skills depend on multiple areas of the brain". It emphasizes that learning is not a simple process of learning or thinking because it occurs in such a way that the acquired information is distributed in different areas of the brain (Ormrod, 2015) [14]; but, knowledge is generated in the brain before birth, in fact, it is known that synaptogenesis begins approximately at the end of the last trimester of prenatal pregnancy however this process continues after birth and reaches its maximum at two years of age (Rohlfs, 2017) [15].

According to Rohfl, 2017 [16], understanding this allows identifying that even the act of memorizing something like the mother's voice that a newborn identifies immediately at birth implies learning, a newborn has not only memorized the mother's voice, but has identified it, it is the same with smell, touch, a newborn learns to identify its mother, what in the animal world would be an act of survival, for humans is a learning process, which occurs in the brain.

Learning in children (4-5 years)

There has been a lot of discussion about when a child should start learning, but what we do know is that once that process starts, it is necessary to consider the appropriate ways in which the child should acquire knowledge. The idea is that children from 3 to 5 years old when entering an educational institution of the initial level begins the process of socialization and development of potentialities guided by a teacher himself who uses different teaching resources, methodologies and tools to accompany the process of training children (Pauccara, 2019) [17].

Game-based learning

Returning to the idea that learning is a process that requires the participation of the learner, in this case the infant, it is also necessary to understand that especially at this age the success or failure of this process can be summarized in the motivation, which must be immersed in the content presented.

Techno-pedagogical integration

Techno pedagogical integration can be defined as the efforts that educators have made to implement technology in their teaching methods, the same that have raised a new model for the learning process and why not for the same learning styles that from a systemic perspective it is possible to better situate learning considering different contexts (Torres, Infante, & Torres, 2015) [18] in this case the interaction between technology and the child

before entering the Educational Center presents a different context and the possibility of using different tools also as the Escape Room. It is in this theoretical context in which the present research is based and in which the Escape Room was developed as a tool for teaching.

Escape Room - Concept and origin

To understand the concept of the Escape Room, Dietrich's idea read in Baena and Ruiz (2019, p. 288) [20] was considered, where he says that "an escape room consists of giving a certain time to a group of people so that, through enigmas and clues, they manage to solve riddles to leave from a certain place".

The origin of the Escape Room can be established in 2006, in Silicon Valley, United States where they created Origin, it is an interactive game in an enclosed space whose objective was to give life to Agatha Christie's novel, although that Escape Room was not the one that is known now, it gave the bases that would finally be used in Asia and Europe to generate escape rooms based on solving problem and searching tracks.

Importance and benefits

Aside from the fact that the Escape Room was built to entertain escape rooms, they currently generate many benefits that can be applied in pedagogy, these are: teamwork development generated through the participants, the organization functionality is essential to operate in an organized manner and advance in the game, the memory use while finding clues or solving riddles in the Escape Room, proposes a system of codes memorization, work under pressure and meaningful decision making during the game; time is a determining factor for participants to make more effective decisions in the shortest possible time. These are some of the benefits that can be extracted from a traditional Escape Room.

The importance lies on the use that can be given to these benefits in the teaching field. Escape Rooms can be used as tools in the teaching-learning process to generate innovative content and attract the attention of students with the implementation of new contexts to obtain learning.

Methodological design

The present research was based on a quantitative approach, since a process of collection, analysis and interpretation of quantitative data was carried out to respond to the problem statement and achieve a broader and deeper perspective of the two variables to be treated as: the escape room and learning. Through this approach, various sources and types of data were considered to understand the reality investigated.

Research modality

For this project, a descriptive and field research was considered to obtain data through the survey technique; since generation of knowledge was intended with direct application to the problems that currently arise in initial education, such as the improvement of the learning process due to the class virtualization for under 6 years children. The process of linking theory and product was addressed, that is, between the ICT use at the initial level and the escape room implementation as a learning strategy at this level, to promote meaningful

learning and an approach the use of ICT in early childhood. For the data processing, descriptive statistics were considered, which allowed to collect, analyze and describe the characteristics of the population under study.

Population

To carry out this study, 22 training teachers from seventh and eighth level of the Human Sciences of Education and Social Development Faculty, form a University in Quito´s city were considered, who carry out their practices in different educational establishments.

Table 1 *Study Population*

Units of analysis	Participants	Percentage %
Teachers 7th	11	50
Teachers 8th	11	50
TOTAL	22	100

Source: Higher Education Institution

Analysis and Results Interpretation

1. Does the teacher plan activities to reinforce physical and mental activities?

Table 2 *Classes with physical and mental abilities*

	Frequency	Percentage	Surveyed People
1	ALWAYS	23 %	5
2	USUALLY	50 %	11
3	SOMETIMES	18 %	4
4	HARDLY EVER	9 %	2
5	NEVER	0 %	0

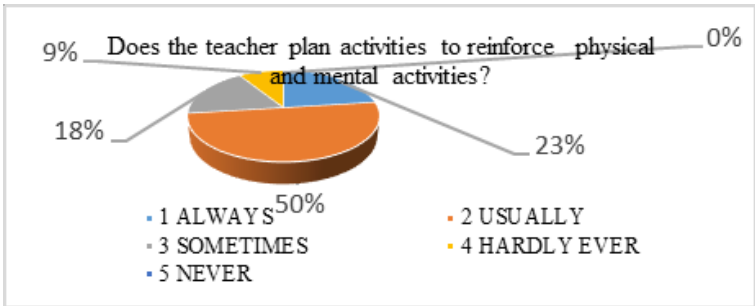

Figure 1 Classes with physical and mental abilities

Analysis and interpretation

According to the survey results, it can be evidenced that 50% of teachers specify that they usually use activities that promote physical and mental skills development in children, while 23% always use it. In this case the graph allows to note that most teachers consider in their planning the use of the aforementioned activities, which would indicate that they have knowledge of the Initial Education Curriculum, however, it is worth mentioning that these

activities have the same application in virtualized education. Both Shunk (2012) [21] and Ellis (2015) [22] mention that the teaching-learning process should be not only a process of information exchange but also encourage different physical and mental skills development.

2. Does the early education curriculum have challenges in learning environments?

Table 3 *Contents of the Initial Education Curriculum*

	Frequency	Percentage	Surveyed People
1	ALWYAS	36 %	8
2	USUALLY	23 %	5
3	SOMETIMES	9 %	2
4	HARDLY EVER	32 %	7
5	NEVER	0 %	0

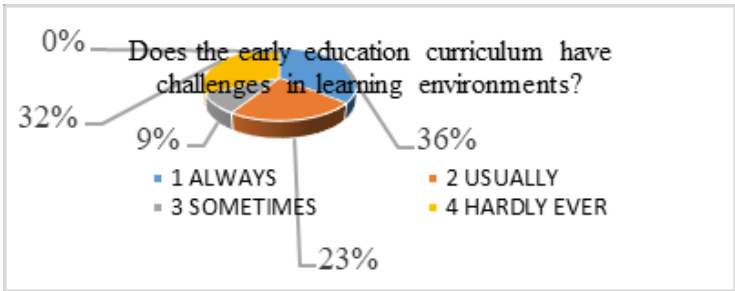

Figure 2 Contents of the Initial Education Curriculum

Analysis and interpretation

The graph shows that 36% of teachers, claim that content from the initial education curriculum can always be addressed when planning challenges in learning environments, and 23% mention usually, and 9% sometimes. While 32% show that a group of teachers have difficulty integrating the contents of the Initial Education Curriculum when planning activities that constitute a challenge. The Technical Team of the "Dirección Nacional de Currículo" (2014) [23] mentions that the educational curriculum is carried out with flexible approaches because it allows the teacher through his preparation and creative capacity to propose activities in which they cover one or more areas of development and learning. Within these activities, challenges that will contribute to children's learning must be contemplated.

3. Does the teacher use games to create challenges to get children's higher participation in group or individual in the learning environments?

Table 4 *Use of challenging games*

Frequency	Percentage	Surveyed People
9	ALWAYS	41%
10	USUALLY	45%
3	SOMETIMES	14%
0	HARDLY EVER	0%
0	NEVER	0%

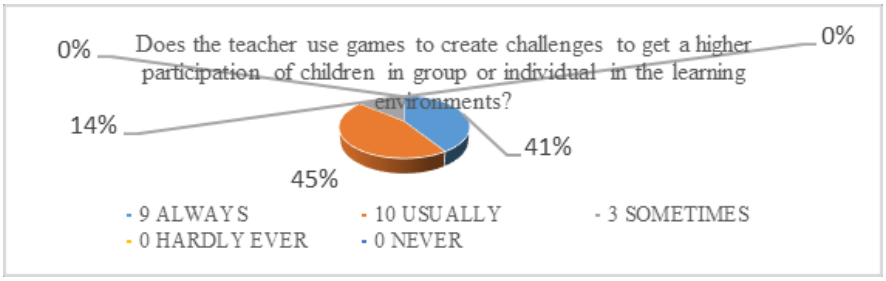

Figure 3 Use of challenging games

Analysis and interpretation

According to this graph, 41% of teachers always use challenges games to encourage greater children´s participation of either individually or in groups, 45% usually do it, while 14% sometimes. It is evident that most teachers use games that constitute challenges in learning environments, however, there is a small group that does not do it frequently.

Hence the need for teachers to know about gamification to use it in virtualized education, since it allows to generate this type of challenges that help children in themselves learning.

4. Do you know how to carry out challenges throughout Escape room?

Table 5 *Challenges through the Escape room*

Frequency	Percentage	Surveyed People
3	SI	14%
19	NO	86%

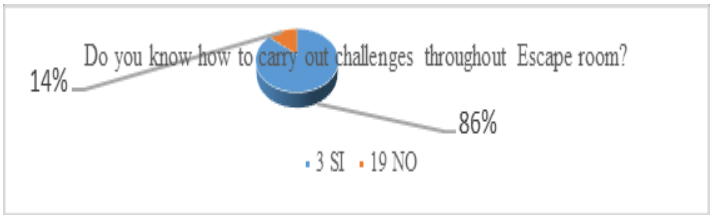

Figure 4: Challenges through the Escape room

Analysis and interpretation

The graph shows that 86% teachers do not have knowledge regarding how to implement challenges through the escape room and 14% admit to having little knowledge. Face with this graph, the need to educate teachers about innovative strategies such as the escape room is clearly observed since they state that they do not have enough knowledge for its implementation in the classroom, which was a key factor when deciding on the implementation of the escape room in the virtual classes for children. The implementation of this strategy becomes even more evident taking into account that the paradigm of learning has changed, children born together with technology, and require from their teachers other types of teaching strategies to which teachers have had to be coupled according to the current need; having a child in front of the computer is not the same as teaching face to face especially if he is a digital native, requires more stimulus.

Conclusions

Once the survey of 7th and 8th year teachers of Human Sciences of Education and Social Development Faculty of a University in the city of Quito was carried out and analyzed, the following was identified:

It was found that teachers have knowledge about the use and benefits of the ICT application, frequently mention innovative learning strategies, in addition to considering gamification "very relevant" since they reveal the use of activities that promote physical and mental skills and increase the child's participation. In the same way, they agree on the importance and feasibility of incorporating challenges in virtual teaching, so they show openness and total availability to receive training in relation to the implementation of innovative teaching and learning strategies, especially in relation to the Escape Room.

However, they also claim that they lack a better understanding of how to achieve the challenges that involve sequential resolution and that they have difficulty incorporating content from the Early Education Curriculum into the activities they plan; they also report not knowing how to use or apply games or challenges that encourage teamwork and promote the development of thinking, attention and will in a virtual way. Therefore, teachers also report not having knowledge of how to implement challenges in the Escape Room and therefore do not know how to implement this innovative learning strategy.

Finally, in relation to the knowledge and skills possessed by the teachers together with their weaknesses in some subjects, they are complemented with the motivation and openness to be trained in the Escape Room as a learning strategy, generating the appropriate environment for the application of this strategy in the Institution.

References

[1] IPSO, 2011 https://www.bbva.com/es/la-relacion-de-los-ninos-con-la-tecnologia-aprendemos-juntos-responde-a-todas-las-dudas/

[2] Organización de la Naciones Unidas (2015) “Agenda 2030 sobre el Desarrollo Sostenible” https://www.un.org/development/desa/es/development-beyond-2015.html

[3] Senplades, S. N. (2017). Plan Nacional de Desarrollo 2017 - 2021 Toda una Vida. Obtenido de https://www.planificacion.gob.ec/wpcontent/uploads/downloads/2017/10/PNBV-26-OCT-FINAL_0K.compressed1.pdf

[4] Garcia Lázaro, I. (2019). Escape Room como propuesta de gamificación en educación. Aportaciones Arbitradas - Revista Educativa Hekademos, 71- 79.

[5] Sierra Daza, M. S., & Fernández-Sánchez, M. R. (2019). Gamificando el aula universitaria. Análisis de una experiencia de Escape Room en educación superior. Revista de Estudios y Experiencias en Educación, 102-115.

[6] Castro-García, P. (2019). Escape Room. INNDOCT, 297-303. Cazau, P. (2004). Estilos de aprendizaje: Generalidades.

[7] Muñoz, J. (2020). Entorno Virtual de Aprendizaje Gamificado para el currículo ecuatoriano. MAMAKUNA. Obtenido de http://repositorio.unae.edu.ec/handle/123456789/1391

[8] Garcia Lázaro, I. (2019). Escape Room como propuesta de gamificación en educación. Aportaciones Arbitradas - Revista Educativa Hekademos, 71- 79.

[9] Llorens et al. (2016) Gamification of the learning process: lessons learned https://rua.ua.es/dspace/bitstream/10045/61635/2/2016_Llorens_etal_IEEE-RITA_accepted.pdf

[10] Garcia Lázaro, I. (2019). Escape Room como propuesta de gamificación en educación. Aportaciones Arbitradas - Revista Educativa Hekademos, 71- 79.

[11] Cortizo, J.C., Carrero, F., Monsalve, B., Velasco, A., Díaz, L. y Pérez, J. (2011). Gamificación y docencia: lo que la universidad tiene que aprender de los videojuegos. VIII Jornadas Internacionales de Innovación Universitaria. Universidad Europea de Madrid. Disponibleen:https://abacus.universidadeuropea.es/bitstream/handle/11268/1750/46_Gamificacion.pdf?sequence=2

[12] Werbach, K. y Hunter, D. (2012). For the win: How game thinking can revolutionize your business. Philadelphia: Wharton Digital Press.

[13] Ormrod, J. (2015). Aprendizaje humano (4TA EDICIÓN ed.). Madrid: PEARSON EDUCACIÓN, S.A.

[14] Ormrod, J. (2015). Aprendizaje humano (4TA EDICIÓN ed.). Madrid: PEARSON EDUCACIÓN, S.A.

[15] Rohlfs, P. (2017). Desarrollo del sistema nervioso humano. Perspectiva general del estadio prenatal hasta 2013. Revista Internacional de Psicología, 1-50.

[16] Rohlfs, P. (2017). Desarrollo del sistema nervioso humano. Perspectiva general del estadio prenatal hasta 2013. Revista Internacional de Psicología, 1-50.

[17] Pauccara, R. (2019). Las tic en el proceso de enseñanza-aprendizaje en niños de edad preescolar. (U. N. Tumbes, Ed.) Obtenido de http://repositorio.untumbes.edu.pe/bitstream/handle/UNITUMBES/1303/

[18] Torres, J. C., Infante, A., & Torres, P. V. (2015). Aprendizaje móvil: perspectivas. RUSC, 38-49.

[19] Baena, A., & Ruiz, P. (2019). Metodologías Activas en Ciencias de la Educación. España: Wanceulen.

[20] Baena, A., & Ruiz, P. (2019). Metodologías Activas en Ciencias de la Educación. España: Wanceulen.

[21] Schunk, D. H. (2012). Teorías del aprendizaje. Una Perspectiva educativa (Sexta edición ed.). México: Pearson Educación.

[22] Ellis, J. (2015). Aprendizaje humano (4TA EDICIÓN ed.). Madrid: PEARSON EDUCACIÓN, S.A.

[23] Ministerio de Educación. (2020). Currículo Educación Inicial 2014. Obtenido de https://educacion.gob.ec/wp-content/uploads/downloads/2016/03/CURRICULO-DE-EDUCACION-INICIAL.pdf

Contact email: azucenapatiño@uti.edu.ec
samaryguillen@uti.edu.ec
epazmino@uti.edu.ec