



# New approaches to learning and assessing through escape rooms in English and Science areas

**Nuevos enfoques para aprender y evaluar con “escape rooms” en las áreas de inglés y ciencias**

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## HIGHLIGHTS

- New approaches in the use of “escape rooms” in the English subjects.
- Collaborative learning as a tool to deal with the competitiveness in class.
- Educational experience with high-school students.

## TITULARES

- Nuevos enfoques en el uso de las “escape rooms” en las asignaturas de inglés.
- Aprendizaje colaborativo como herramienta para tratar la competitividad en clase.
- Experiencia educativa con estudiantes de bachillerato de ciencias.

## **ABSTRACT**

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Some of the current and ongoing challenges ahead in the teaching of English in science areas include the competitiveness among students and the traditional ways to assess their progress. As a proposal in order to meet these goals, we advocate escape rooms that have been considered as a powerful tool in education. However, we want to incorporate a new element in this educational experience. Students do not have to “play” an escape room but to “create” an escape room. Throughout the creation of the escape room, students had to rely on their group members as there were some tasks that not everybody in the group knew how to solve. That emphasized the teamwork and cooperation rather than competitiveness. Students were revising all the knowledge learnt in different subjects to be able to create the tasks for the escape room and this helped us to assess the understanding of the content. Results showed creativity, collaboration, problem solving and critical thinking at the same time that the challenges and objectives established were completely met.

**Palabras clave:** escape room; inglés; aprendizaje colaborativo; evaluación; competitividad.

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## **RESUMEN**

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Algunos de los retos actuales en la enseñanza del inglés en las materias de ciencias incluyen la competitividad entre los estudiantes y la manera tradicional de evaluar su progreso. Como propuesta para conseguir estos objetivos, proponemos las “escape rooms” consideradas como herramienta poderosa en educación. Sin embargo, el nuevo elemento que nosotros incorporamos a esta experiencia educativa no es que los alumnos “jueguen” sino que “creen” una “escape room”. A lo largo de la creación de la “escape room”, los estudiantes tuvieron que confiar en los miembros de su grupo ya que había tareas que no todos los componentes del grupo sabían cómo resolver. Esto manifestó el trabajo en equipo y la cooperación más que la competitividad. Los estudiantes revisaron todo el conocimiento aprendido en diferentes asignaturas para poder crear las tareas de la “escape room” y esto nos ayudó a evaluar el entendimiento del contenido. Los resultados mostraron creatividad, colaboración, resolución de problemas y pensamiento crítico al mismo tiempo que los retos y objetivos establecidos para esta experiencia educativa se cumplieron en su totalidad.

**Keywords:** escape room, English, collaborative learning, assessment, competitiveness.

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## **1. INTRODUCTION**

The new changes in the society are critical for understanding the emerging trends in education. Teachers and professors cannot be trapped in previous centuries and we must be quick to adopt new innovations and be able to make the necessary changes to stay up-to-date.

Nowadays, students must face at different and challenging situations due to the society in which they are living and the education system should not be shackled to an outdated teaching method and should offer the possibility to deal with new education environments. Therefore, teachers and professors should “escape” from the outdated teaching methods, rethink their strategies and adapt their classes to this circumstance. To cope with this new emerging reality, new trends in education are to be experienced and evaluated.

### **1.1. DIFFICULTIES AND PROPOSAL**

Despite the substantial progress observed in education, some difficulties remain a challenge for teachers and professors.

One aspect to be raised in the English classes is the competitiveness or educational competition as it could threaten prosperity. It is true that students are driven by a society that hinges on intense competition but collaborative relationships and social networking are also enjoying a renewed prominence.

This is the reason why our idea is not to avoid competitiveness as it will surround students all their lives. As teachers, it is duty bound to consider it from another angle. Therefore, addressing the urgent need to deal with the competitiveness in the classroom, greater emphasis should be given to teamwork and cooperation.

Another aspect included in our reflection covers the evaluation field. As educators, the understanding of complexities of evaluation has always been under discussion and it is subject to disagreement. Evaluation was largely considered being doomed to failure and incoherence.

We could name the nominal or ordinal scales, the interval or ratio scales. It is noteworthy the items used for each assessment, that is, the multiple-choice items, the true-false items or the matching items, each one with its strengths and weaknesses. It should not be forgotten the essay items or the short-answers items. It is also worth mentioning the formal and informal evaluation or the formative and summative evaluation (Reynolds et al, 2010).

As we all know, different procedures to assess or evaluate can be found although the objective of this article is not to assess the best way of evaluation, nor is it to name and explain all of them.

We believe that there is no good procedure to evaluate but a combination of several ones depending on what it should be evaluated in each moment. Bearing that in mind, we claim that evaluation should be subject to new forms.

That being said and taking these two aspects as a premise, the proposal should be a task that presents a challenge, a complex but feasible challenge (Fen Ng and Kiat Ng, 2015). It should be original, attractive and assessable.

Demand is on the up and at the same time, we are facing with more interactive and collaborative technological environments (Amberg, Reinhardt and Hofmann, 2009). Taking that into account and being our firm belief that attitude and emotions play a decisive role in the fact of learning a language; students will be facing at the creation of an escape room as an example of collaborative learning in the science subjects.

Escape rooms have been included in education and they are enjoying a considerable growth. (Stone, 2016 or the Ontario Escape Room Unconference). However, they were used with the objective of learning with them. Our new perspective and as reported by Khatibi & Cowie, "The key here is learning from games, rather than with games" (2013:38).

That will be in line with the revised Bloom's taxonomy in which the last layer consists on the creation. In order to create something, the students must have understood and that will be the best way to assess the content learnt by them.

In the same line, we should quote Chickering and Ehrmann (1996): "Learning is not a spectator sport. Students do not learn much just sitting in classes listening to teachers, memorizing pre-packaged assignments, and spitting out answers. They must talk about what they are learning, write reflectively about it, relate to past experiences and apply it to their daily lives. They must take what they learn part of themselves".

All in all, we advocate this escape room as a proposal as it will foster in students outstanding assets such as innovative potential together with specific skills (competence or creativity).

## **1.2. JUSTIFICATION**

As previously stated as difficulties, never let it be forgotten competitiveness and evaluation. The key points that will help solving these aspects are the collaborative learning and games, more specifically, escape rooms.

With regard to the first feature, competitiveness, collaborative learning should be placed. Conforming with Leigh Smith and MacGregor (1992:2), "in most collaborative learning situations students are working in groups of two

or more, mutually searching for understanding, solutions, or meanings, or creating a product". Therefore, students will not be just taking ideas but creating something new with this information.

This kind of learning involves students working with others and helping each other to cope with a specific situation. Students will acquire an active voice as they have to comment their points of view. In addition, they will shape their ideas by listening to the others' opinion and receiving feedback and all this will ensure a consensus. These tasks are usually emotionally demanding. Nevertheless, they will hold the key to future growth.

In the same line, Shindler (2009), stated that "group members will change the way they regard one another. The competitive condition encourages them to view their fellows less as peers or members of a learning community and more as instruments to be used to reach the goal".

According to Schwartz (1999), it has been considered not only as an effective way of teaching but also learning. An effective teamwork will permit communication within groups and strengthen individual identities. Each individual identity will help foster communal identities too.

Therefore, students will be free to express their opinions, to seek practical solutions for their needs and to engage in debate. Students will have to work on their ability to accept and tolerate others' opinion and solve differences in order to reach an agreement.

Not only should students learn strategies and competences but they also should make effective use of them. This aspect will entwine with the other aspect of our proposal, games and escape rooms.

The second aspect already mentioned, that is evaluation, could be resolved with the escape room (game) too. This kind of escape room is used to assess the student understanding. It will be a reflective or evaluating system as students must discuss about the choices that they made. They probably choose the content area that they know better and the teacher must see the aspects that could have not been understood by students. Each group may have chosen a different content area; hence, it will be a review of all the knowledge learnt in class.

In conclusion, in order to include the two aspects in an educational experience, students will have to create a challenging task based on the content learnt in different subjects. This kind of collaborative learning will challenge students to practice what they know and create something new through a game.

### **1.3. THEORETICAL FRAMEWORK**

As reported by Leigh Smith and MacGregor (1992), the collaborative learning was finding prominence in the 1990s so it is not a recent concept. However, the new ways to develop and adapt the collaborative learning to new contexts is what it is booming right now.

For its part, games have garnered more interest in the last years. The game is considered as an engine that produces and creates something new. Moreover, it is used for students to deliver understanding about a content area.

The escape room will be considered as a kind of “game” although games normally have a “win” state but in the escape rooms, the victory consists on knowing how to escape the room.

The fact of including escape rooms as a game has a consolidated and firm basis on what Klopfer, Osterweil and Salen (2009) claimed. They believed that in games, students will

exercise freedom along five distinct axes, that is, freedom to fail, freedom to experiment, freedom to fashion identities; freedom of effort and freedom of interpretation. Furthermore, games have been considered to be more effective than boring lectures.

Escape rooms have taken off recently and they were fueled by companies focused on leisure and free time activities. Nevertheless, its incorporation in the field of education has enabled teachers and professors to keep students engaged and motivated (Cambridge University Press, 2017).

### **1.4. OBJECTIVES**

For this experience, some objectives were foreseen. As main objectives, we can include:

- To foster student learning as well as student performance.
- To make effective use of the collaborative learning and ICT in a language class.
- To make students revise the content area with an original and attractive task.
- To use English as the language in order to communicate and to strengthen new vocabulary from other subjects in English.

The question at issue is the English subject in science areas. The level that needs to be achieved or that our students must have (depending on the course) is the B2. According to the Cambridge English scale, in this level, students must be able to hold the conversational partner's attention and to communicate straightforward ideas (Cambridge English Language Assessment, 2015).

## **2 METHODOLOGY**

Escape rooms have already been used in teaching a foreign language. However, the new

proposal of this article is to encourage students to create an escape room with the new knowledge acquired in different subjects.

In order to do that, students will need to have fully understood the content studied in different subjects such as technical drawing, mathematics, etc. and to create an escape room. This escape room will be presented and played by the rest of students.

This kind of escape room is not possible with teenagers as there are essential requirements to be complied with, that is, mature, productivity, collaboration, analytical thinking, originality, problem-solving, systems-thinking, to name but a few. Consequently, it is a feasible activity with high school students or university students as it requires them to meet the above mentioned conditions.

Some of the hints provided to the students in order to create the escape room were:

- It must include as many tasks as different subjects they have.
- It must have a plot that mixes every subject in order to achieve the final task, that is, to be able to escape.

The objective is to assimilate new content in a modern and different way so that the knowledge is better comprehended. If the group is not able to escape the room, the creators of the game must explain every exercise to the rest of students in order to let them know how they should have carried it out and everyone should reflect on the results. This will decrease the competitiveness as they will need the other students in order to achieve the final goal. They will realize how important the help of others is.

The methodology employed will consist on a collaborative learning task that will take into account the scaffolding strategies needed in a classroom. For this reason, the teacher or

professor must start by doing the same activity that the students are supposed to meet (Alber, 2014).

Indicative timetable (55 minutes class):

1<sup>st</sup> session: Students will play an escape room already elaborated by the teacher or professor. This will provide them with ideas and the knowledge about the functioning of an escape room. Some of the ideas taken for the elaboration of this escape room were extracted from Nicholson (2015).

This escape room will lead students to the previous knowledge already acquired in lessons. That will follow one of the principles of the scaffolding strategies, that is, tapping into prior content area and connecting it to the future. Not only will this strategy be used in this session but also the main one of the scaffolding strategies, that is, to show and tell (Alber, 2014).

2<sup>nd</sup> session: The teacher or professor elaborates the different groups for the escape room. The way to divide students in groups will be done by subjects, hence, in each group, there will be a student who studies a different optional subject. This will help the project to have diversity of students, another specificity of collaborative learning. Each member of the group will be the expert and the others must learn from him and trust him.

Each student will bring a different perspective that will share with the rest and it is through this conversation that they will learn (Golub, 1988). And within this aspect, the cooperative learning will appear as this kind of learning is based on the social interdependence. Every group will have to work together in order to maximize the learning of each member of the group (Johnson, Johnson & Holubec, 1999).

As reported by Leigh Smith and MacGregor (1992), some essential elements should never be

shelved in the cooperative learning. One of them is the positive interdependence, therefore, we must be sure that every student contributes to the collaborative task.

The teacher will explain the details about the escape room that each group has to create and he will give them a rubric. This rubric will include the elements that should be borne in mind when creating the escape room. That will help them to understand the expectations placed upon them. That will follow another scaffolding strategy – give time to talk (Alber, 2014). Therefore, students will have time to verbally process the new information and make use of it.

3<sup>rd</sup> session: The group must reach a consensus about the different activities which are part of the escape room. In order to do that, every member of the group must give his opinion and his proposal about a specific activity. All the activities must be agreed and justified. This will follow the ideas by Fen Ng and Kiat Ng (2015) who highlighted the importance of tasks chosen by students.

4<sup>th</sup> session – 5<sup>th</sup> session: In these two sessions, the teacher or professor will provide materials, places and time to elaborate the tasks and prepare the escape room. The teacher will not be in these sessions the dispenser of knowledge but a guide of this knowledge.

6<sup>th</sup> session: Development of the escape room. In this session, students will play one of the escape rooms elaborated by a group of students. There could be as many sessions like this one as groups we have in our class.

7<sup>th</sup> session: Evaluation of the escape room through rubrics.

One of the intangible assets that every student has to prove is the ability to make judgments. They have to be able to analyze and evaluate

information and make a reasoned decision which will empower their critical thinking. Every group will have to assess the other groups with the rubrics that they saw in the first session.

Some of the elements that should be assessed according to these rubrics are:

- Communication: The group did not use course language correctly or they did it in a clear way and in correct context.
- Media: Use of new technologies (images, computers, mobile phones, videos) in order to assist students in understanding the scope of the escape room.
- Thought and creative thinking: Lack or demonstration of creativity throughout the escape room.
- Use of English (grammar, pronunciation, spelling, etc.): Persistent errors, few errors or an outstanding use of English.
- Organization: Ineffective, effective with errors or effective.
- Amusement/Enjoyment: The escape room captivates the students or makes them bored.
- Time Management: Waste of time or excellent use of time.
- Participation: Unengaged with tasks, mostly or entirely engaged and eager to work and find a solution.
- Scope: Unable to define the scope, adequately, competently or skillfully defined.

## 2.1. BARRIERS

We must recognize the barriers that, although not insurmountable, pose continued challenges that must be overcome. To name a few, we could find:

- Attitudes: Games in educational environments are often not well regarded by some teachers, parents or students.
- Timing: The time structure of classes does not always allow completing the entire game.

## 2.2. SUCCESS INDICATORS

- a) Success indicators for the escape room itself, that is, the fact of escaping the room.

The success of the task will not be possible if any of the individual challenges have not been overcome. Hence, the vital importance of the autonomy of every student and the confidence placed in every member of the group. It will give them a boost of confidence.

- b) Success indicators for the success of the escape room as a cooperative learning activity.

According to some schools (e.g. colegio Artica in Madrid), in a cooperative learning, three questions must be answered in order to assure that the activity will be successful.

- Does everybody participate? It can be documented that every student in the class has participated as every student in the group is in charge of a different activity. This activity can only be carried out by some students because not everybody knows about the content area that he or she was preparing.
- Do they need each other? Every person in the group needs the others because not everybody studies the same subjects. Therefore, when facing at a specific activity, in some cases, students are the experts and in some others, they are novice.
- Can I verify the task? The task can be verified because an escape room must be presented. The escape room will be composed of different activities which should have been elaborated by different students.

## 3 RESULTS

The creativity of the students exceeded our expectations so the potential of our students was soon to be realized. Regarding the scope and plot of each escape room, we will show some ideas.

One group assumed the role of the characters in The Big Bang Theory and each character had a different task. In another group, the idea was to solve a crime and each task would give the groups an idea of the person who could have killed the person. In another group, students were led to believe to be shipwrecked in their final studies trip. As a consequence, they had to escape from the island where they were.

Regarding tasks, some subjects and the specific content revised in them could be mentioned.

In technical drawing, they had to solve a puzzle. They had to draw some objects (for example a key, a spoon, etc.) bearing in mind axes, distances, inclination, radius, height, etc. They also had to recognize the correct parabola or to revise the construction of a specific angle.

In industrial technology, students created some quizzes about the properties of PVC, elastic modulus equations, phases and neutral wires, solar beams and the energy used to produce electricity, etc. Another group made a game with different envelopes and students had to fill the envelopes with the characteristics of some allotropes (diamonds, graphites, etc.).

Some other subjects such as mathematics with tasks regarding cut-off point in lines or equations were carried out.

Some groups thought about the same kind of task and that made us reflect. On the one hand, that meant that a specific content had been perfectly acquired. Therefore, that might be a powerful way to evaluate this knowledge. On the other, and following the old adage, practice



makes perfect, we were sure that, those students who had not yet acquired the content, would have the opportunity to learn it.

At the beginning of this article, we mentioned the B2 level as the appropriate English level for this task. Students showed the adequate level as they were able to understand abstract and concrete conversations or texts. They also included technical discussions about the different tasks to be performed in the escape rooms. Therefore, they interacted with fluency and spontaneity.

According to Chickering and Ehrmann (1996) mentioned in the introduction, students should be able to reflect on what they are learning, to relate it to past experiences and to write reflectively about it. With this idea in mind, we asked students to write their experiences regarding this new trend of education, escape rooms. It is worth mentioning some of these ideas that will be displayed just as students wrote them.

“One year ago more or less, I went to a place with my family where we had to escape from a room in 60 minutes. I loved that because we had to find different clues and we had to solve different tasks and I loved everything. When the teacher tell us about the project, a escape classroom, I was enthusiastic and I started to think different ideas to prepare my own classroom. I enjoyed everything.”

“First of all, I had never been in an escape room so this was new for me and I found it very interesting because we could practice our speaking in English and also the other subjects. It was a nice activity because it wasn't something hard to do, it could help us to relax from other exams we had been doing.”

“First of all, I would like to say that I personally had a lot of fun playing them and I liked the fact that we had a lot of time to prepare and think

about it so that they could be original and interesting and also innovative.”

This is an example of the reflective thought of our students in this educational experience that shows the good acceptance of escape rooms in terms of learning.

## **4 CONCLUSIONS**

In accordance with the society in which our students have to live, new trends in education are to be offered.

Having been displayed and analyzed some of the current and ongoing challenges ahead in the teaching of English in science areas, we have proposed the creation of an escape room as a powerful tool in education. Needless to say, this is not the wand to all existing problems but it could be of great assistance.

The challenges and objectives presented at the beginning of this article have been met. Several conclusions may be drawn from the results highlighted above.

Competitiveness is an element to be present as students have to compete against other groups in order to escape the room. Nevertheless, in this competitiveness, they will have to rely on their group members as there will be some tasks that not everybody in the group will be able to solve. Yet another viewpoint emphasized the teamwork and cooperation rather than competitiveness.

Furthermore, challenges are offered by students. That means that challenges will seem worth attempting and students will call out the other groups with their tasks and originality. Therefore, failure (an important aspect in competitiveness) is a possibility that might take place and should take place in order to learn.

Regarding evaluation or assessment, we have claimed that evaluation should be subject to new forms.

We could evaluate the knowledge that a student has about technical drawing in a formal way, that is, in an exam asking him to draw a specific object.

We could have also asked them in a multiple-choice exam or some short-answer exam aspects such as vanishing points or the right angle projection, among others.

We could have prepared an exam with the same questions (elastic modulus equations, phases and neutral wires, allotropes, etc.) that the quiz carried out by students as a task of an escape room.

This would have been the traditional evaluation used in classrooms. However, the escape room represents another way to gauge student understanding in a different and informal way, moving away from exams and formal ways to evaluate.

Our proposal, that was made to reinforce existing knowledge and not to explain new content, carries myriad benefits to the students' progress.

Students were more attentive to the fact of being the first to escape the room than to the fact of accomplishing the tasks in the correct manner. This could have had as a negative aspect the production of sloppy tasks. Nevertheless, in order to reach admission to the next stage, activities should have been completed properly so they were learning skills indirectly.

For students, the objective was not to get the best mark but to be able to escape the room. Meanwhile, they were working, revising and assimilating the content studied in class.

Students will learn skills both directly and indirectly and not only the main objectives stressed at the beginning of the article were fulfilled. Other secondary and underlying targets have been achieved too.

Just to mention a few examples, students were able to sharpen their decision-making; to learn how to concentrate when surrounded by noisy environments or situations; to improve the speed at which they can solve problems; to learn how to cope with stress when everybody is counting on them and when time is at premium; to develop social skills; to revise science skills or to make use of the English not only by learning the specific name of a content but also by using it throughout the activity.

In conclusion, the foregoing analyses lead us to hypothesize that this kind of learning might have an impact in education as all the objectives were covered and it helped to enhance students' confidence.

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El próximo 6 de junio de 2019 se desarrollará el **VI Seminario GATE** bajo el título "**Neuroeducación y aprendizaje**", organizado por el Gabinete de Tele-Educación del Vicerrectorado de Servicios Tecnológicos. Durante la jornada, prestigiosos especialistas expondrán, desde sus respectivos enfoques, cómo el conocimiento acerca del funcionamiento del cerebro puede ayudar a mejorar el proceso de enseñanza y aprendizaje. Contaremos con la participación de Francisco Mora Teruel (Universidad Complutense de Madrid), Anna Forés Miravalles y Jesus C. Guillen (Universidad de Barcelona) y José Y. Pastor Caño y Víctor Maojo García (Universidad Politécnica de Madrid). La [inscripción](#) es libre y gratuita.