Research Article

GAMIFIED EXPERIENCE IN SEMI-ATTENDANCE EDUCATION FOR ADULTS: INTEGRATING CONTENTS AND MOTIVATION

Education

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Abstract

This work has been carried out as a new line of research that belongs to the education field. The aim of this research was to try a new educational and innovative approach in class in order to boost students' motivation. Gamification has become a present concept in the educational world. This term had its origin in the industrial and business field but for a few years it has become an essential element in the classroom. This paper aims to show the first gamified experience in which three content teachers: Biology and Geology, Physics and Chemistry and English worked together to put in common contents, objectives and own materials of three different subjects in the same activity. Firstly, a brief overview and descriptions are made of the origin of the gamification concept and some of its meanings related to education. Secondly, the gamified activity is described; the participants who took part in it, the digital generations to which the participants belong, the stages that the activity was organized.Finally, the results and conclusions we obtained from this experience are presented (by means of bar graphics), the reflections extracted and the material that has been used is added in the appendix. In conclusion, this gamified experience in class gave teachers the opportunity to learn more about gamification and motivate students in their own learning process.

Introduction and Theoretical Framework

Technology is an essential part of our daily life, so much so that it was previously considered a useful tool in the work setting through the use of computers, printers, scanners and the Internet. Later, it was integrated into the educational field in which this resource was taken advantage of to promote more dynamic and motivating learning, make researches in the classroom through webquests, watch videos, carry out email exchanges or videoconferences with other educational centres, etc. To this, new electronic devices have become indispensable in our day-to-day life to do almost anything.

Almost everybody use or know how to use technology, it depends on the use we give to it. It can be useful to entertain, motivate, teach, learn, work, read, write, watch, listen, search, share, upload or download information, buy or sell, etc. It also depends on the age and the usage of technology of the users and it is related to the digital generations. According to the Institute of Digital Economy (ESIC, 2017) we can organize the diverse digital generations into six groups:

Table 1: Digital generations and its main characteristics

Digital generations	Characteristics
Silent generation	-The age of the users is between 74-93 years. -They like to "keep in touch with their loved ones" by means of phone calls. -They may suffer frauds through the internet. -Only 15 % of this generation usually use the internet. -They do not know "aspects related to privacy and data sharing on the internet". -They have big and simple icons in their devices.

Baby boomers	-The age of the users is between 54-73 years. -They use Facebook as his favourite social network. -They use technology as a way to be close to their relatives and friends and to be active and avoid illnesses as "dementia or Alzheimer". -They like reading blog, articles, watching videos and sharing information on the internet.
X Generation	-The age of the users is between 39-53 years. -They like "having an active social life". -They like going on improving their abilities in technology. -They like social networks as: Facebook, Instagram, Twitter and Pinterest. -They usually communicate using emails and phone calls, but they also use apps.
Millenials	-The age of the users is between 18-38 years. -They are known as 'selfie generation'. -They feel they are unique and prefer personalized products and services. -They use the social network Instagram a lot. -They consider the online and offline world as the same reality.
Z Generation	-The age of the users is between 7-17 years. -This generation is called 'digital native' because they have been using technology since they were born. -They are an open minded generation aware of diversity, multicultural and gender. -They watch a lot of videos and use snapchat and youtube very usual. -They usually communicate by means of images, emoticons and memes.
Alpha generation	-The age of the users is between 0-6 years. -They are growing in a technological environment. -They are able to search videos or images before they can read. -Technology is not a tool for them; it is "something integrated into their lives". -"Computer programming will be one more language to learn".

Adapted table, source (ESIC, 2017)

In this educational experience has participated generations from Baby boomers to Millenials and it is important to describe each digital generation to understand how the experience has been developed because it will be different depending on the users' abilities.

Definitions of the Concept 'Gamification'

It is necessary to start providing a brief overview of the origin, definitions and uses of this current term. This concept was coined in the year 2002 by a British consultant called Nick Pelling, he used this word "to describe applying game-like accelerated user interface design to make electronic transactions both enjoyable and fast" (Burket, 2014). He considered 'gamification' to all the technological components, so he invented the concept to sell "the services of a start-up consultancy named Conundra Ltd", however, this concept will means more than the own company. Another theory said that in 2008 Brett Teril used this concept as 'gameification' in a blog to describe "taking game mechanics and applying them to other we properties to increase engagement". During 2010 this term started to be used in the industrial business. In 2011, 'gamification' was in the second place in the list of word of that year, it was developed by Oxford dictionaries.

It is very common to associated 'game' to the concept of 'gamification', but this term is different from a 'serious game' or even to the 'game based learning'. Game based learning is understood as the way of learning throughout games that encourage students' motivation and

participation. However, 'gamification'tries to integrate elements from games as: rewards, score, avatar, aims, rules, surprise, curiosity, etc. Gardner described 'gamification' as "the use of game mechanics and experience design to digitally engage and motivate people to achieve their goals", (Burket, 2014) where the essential elements of this game mechanics are "points, badges and leaderboards". Creating experiences in which a contextualized game is offered describes "the journey players take with elements such as game play, play space and story line" that are fundamental to integrate students in this atmosphere (Burket, 2014).

It is obvious that there is a very close relationship between the concept 'gamification' and 'game'.According to the authors Kai Huotari and JuhoHamari (2012), game is considered as "an exercise of voluntary control systems in which there is an opposition between forces, confined by a procedure and rules in order to produce a disequilibrial outcome", to this idea Juul, (2003) as cited in (Huotari, and Hamari, 2012) added that it is "a rule-based formal system with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels attached to the outcome and the consequences of the activity are optional and negotiable". Deterding et al. as cited in (Huotari, and Hamari, 2012) described 'gamification' as "the use of game design elements in non-game contexts", so to gamify implies to design tasks and activities by means of using principles of the game such as the motivation that a game itself means in the participants. (Posada Prieto, F. 2017).

'Gamification' can be also understood as applying a series of thinking and mechanical strategies that are used in games but not in a game context. It could be considered 'gamification' as a method and strategy because it takes advantage of the attractive elements of the game in an educational context. It means to get a link between the participants and the activity or task where you put in practice elements from gamification. The fundamental thing is to create significant and motivating experiences to students; it will make them learn in a contextualized and relevance atmosphere. By means of 'gamification', it is possible to include activities as the formal study, observation, reflection, practice, positive values, manage and the perfection of the abilities. Using 'gamification' in class is useful, if your aim as a teacher is to encourage students to make progress in their learning process in a different way, to have influence in their behaviours and actions and to create motivation in their learning.(Contreras Espinosa, R., S., and Eguia, J., L. (Eds.), 2017).

According to this idea, the author Karl Kapp (2012) described 'gamification' as "using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning and solve problems". However, the authors Zicherman & Cunningham, (2011) and Werbach & Hunter, (2012) as cited in Borrás (2015) thought that 'gamification' "involves the use of game design mechanics, elements, and techniques in context other than games to engage users and solve problems". So it can be also helpful for students in the way they can find a solution, discuss and come to an agreement, it means that 'gamification' promotes a skillful learning.

In conclusion, 'gamification' "focuses on enabling players to achieve their goals-and as a consequence the organization achieves its goals". The objective of 'gamification' is "to motivate people to change behaviours or develop skills, or to drive innovation" (Burket, 2014).

Background of the experience

This educational practice has been developed at the high-school IES Andrés Bello, this educational center is a public education centre that is located in the metropolitan area of Santa Cruz de Tenerife, between the neighbourhoods of Salud, Gladiolos and Granja park. IES Andrés Bello currently teaches Compulsory Secondary Education (ESO) and previous studies before acceding to university (Baccalaureate) and has around 600 students. Regarding secondary school, the groups are organized into three groups of 1st ESO, four of 2nd, five of 3rd and three of 4th. Among them are: 1st of the Improvement of Learning and Performance Program (PMAR) and two groups of 2nd of PMAR, located between the 2nd and 3rd ESO courses. As for the previous studies before acceding to university, in the morning shift there are three groups of the first of the modalities: Scientific, Technological and Humanistic, regarding the second course, they are organized into two groups, Scientific- Technological group and another one corresponding to Humanistic-Social teachings.

In addition, this centre has semi-attendanceprevious studies before acceding to university for adults that are taught at night (from 17.30 to 22.35 hours). In this type of modality, there are 122 students who are integrated into two courses. Unlike the daytime studies modality, this teaching is constantly changing due to new admissions of adult students. This first year of high school is divided into two groups: the group called 1.1 corresponds to Humanities and Social Sciencesand the group 1.3 to the Sciences modality. The same happens in the second year, in which they are organized into three groups: groups 2.1 and 2.2 correspond to the Humanities and Social Sciences teachings, and 2.3. to the modality of Sciences. This type of semi-attendanceprevious studies before acceding to university allows adult students (over 18 years old) to access to this teaching in order to obtain the high-school diploma. Unlike the daytime modality, thismodality, in accordance with the Order of September 2, 2016, which updates the instructions that develop certain aspects of the Adult Baccalaureate in the Autonomous Community of the Canary Islands, allows students to attend lessons regularly in technical tutorials and they have one hour a week of support tutoring, in which students can reinforce, review or recover content that has been taught. The students who attend to this type of studies are students who are working and cannot attend regularly, students who dropped out of school and take them up again in this way, repeating students who come from the morning shift, students whosejob requires them to be in possession of this title, students who want to do some public examinations, accessingto higher-grade courses or graduating from university.

Participants

This activity was aimed to students of the first courseof previous studies before acceding to university (Baccalaureate)corresponding to the Science modality (group 1.3), in which there are currently thirteen students enrolled, however four of them attend to lessons regularly. The sample of participating students consists of three male students between 19 and 26 years old and one female student of twenty-one. These are adult students who have restarted their studies and who, the majority, have difficulties in acquiring curricular content and are highly demotivated.

Method

Initial stage: designing the experience

The teachers who have participated in this activity are the Biology and Geology teacher, the Physics and Chemistry teacher and the first foreign language: English teacher. These three teachers have organized the contents of the topic that they wanted to include and assess, the objectives that they wanted the students to achieve in the 'escape room' activity and they have sequenced them so that they had a logical order in the development of the story. As for the subject of biology and geology, the teacher has taken advantage of this activity to assess the contents of the subject about cells, types, shapes, elements and they had to be able of distinguishing them. The Physics and chemistry teacher wanted to review contents related to inorganic formulation and chemical elements and the English teacher wanted to work on the reading and comprehension skills.

In the design of the 'escape room' activity was needed to take into account the following elements that are integrated in 'gamification' scene. According to Kapp (2012) and Zichermann y Cunningham (2011), we have considered:

1. The basis of the game: The group had to find out who was the teacher that had been murdered atIES Andrés Bello and how.
2. Mechanisms: at first students had to solve easier activities, game or tasks and little by little when they were making progress they would find more difficult challenges.
3. Aesthetic: the space where they were doing the gamified activity was decorated with objects, posters, furniture, etc; according to the story of this activity *(see appendix 8)*.
4. Idea of the game: the aim of this game was to review contents of three different subjects and at the same time motivate students in their learning.
5. Link between gamers and game: we tried to contextualize all the elements of the story to provide students an intrinsic motivation and a close relationship with the game *(see appendix 2 and 10)*.
6. Players: there are different types of players; some of them were more competitive others more observant but it is important to highlight the good way in which they work as a small group.

7. Motivation: it was one the main aims of this activity, they were very motivated to try new types of activities and also to play *(see appendix 10 and 12).*

8. Promoting learning: this gamified activity tried to give students motivation to face diverse challenges by means of a contextualized game. They had to solve activities individually and in the rest of situations they decided themselves to organize in one, two, four.

9. Solving problems: the students' aim was to discover who was the murdered teacher and find out how he or she had been murdered, so that they had to solve tasks, activities and obstacles (anxiety or stress) before being able to solve the game *(see appendix 11 and 12).*

To end this stage, the teacher created a questionnaire *(see appendix 13)* that was composed of eleven open questions, in which students could express their opinions and give teachers feedback about what they expected before doing the 'escape room' activity and after it. In addition, they could make suggestions to improve future educational experiences.

Intermediate stage: Implementation

The three teachers created a fascinating, intriguing, exciting and motivating story that would frame this 'escape room' activity. The group had to find out the teacher who had been murdered at IES Andrés Bello and how. In each stage, students would dismiss a teacherfrom the educational centre that taught them and in this way, they will deduce that he/she was alive (in the game).

On the day of the activity, the three teachers hadplanned the activity for three hours. In the first hour, the English teacher had lesson with this group, so she would lead the students from their classroom to another one closer to the place that the three participating teachers had decorated and prepared for the activity. In the nearby classroom they had projector, computer, screen, sound system, tables and chairs organized in pairs.

There, the gamified activity started, the other two teachers were waiting for the students willing and disguised of the new roles *(see appendix 9)* they would have in the activity. Students were provided with the instructions prior to entering in the 'escape room': content, objective of the escape room, rules, remember them that it was an assessed activity, time counter, the possible cards (these cards were elements that supply surprise to students, (*see appendix 3*) they could find in their searches and how they could ask for clues *(see appendix 7).* After, they watched a motivating video *(see appendix 1)* of the story that awaited them.(https://lightmv.com/v/8vbhfjr).

The activities and tasks we used in the gamified'escape room' activity were include in a coherent and cohesive way, so that the activities were contextualized, motivating and promote significant learning.

Firstly, the organization of the activities was 'sequential', in this way the students began with activities that were easier and thus motivate themselves and increase their confidence. This

sequential organization means that one activity led to another, a solution gives you the clue to solve the next one until you reach the objective. In the time the students were solving activities and tasks and going on the following challenges, the teachers gave them positive feedback to encourage to manage stress and work efficiently. However, the following stages were organized in an 'open' way, it means that the tasks, activities and puzzles did not have to be done and solved in a particular order (Instituto de la juventud de Extremadura, 2018).

The following activities were used in this gamified activity, these are organized according to the topics of the subjects: Biology and Geology, Physics and Chemistry and the first foreign language: English.

Biology and Geology activities

A board of different types of cells, they had a box with questions to ask about them.

Activity number 1: Each student had a cardboard box with their name and a message of encouragement, in which they were asked a series of questions about various images of different cells that were numbered and placed on a cork on the wall.

Activity number 2: Each student in an envelope they found in the 'escape room' activity had a letter soup about cell types, characteristics and parts of them.

Activity 3: Hieroglyph with the word 'centriole' as a review of the parts of cells.

Furthermore, at one point in the activity the students would collect blood samples, crystals, etc; study the results of this scientific analysis, aspects related more indirectly with the subject would also work in some activities of the Physics and Chemistry.

Physics and Chemistry tasks

Plastic containers created to hide a problem inside.   Crossword of chemical elements
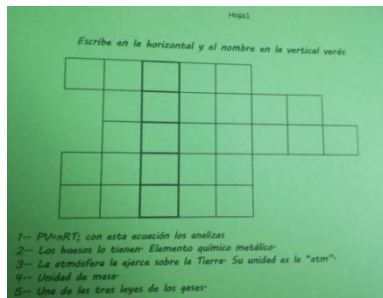
Activity number 1: Crossword puzzle that was made up of different chemical elements, keywords related to gases and important concepts of matter.

Activity number 2: Inorganic formulation problem.

Activity number 3: Study the medical analysis that the students had requested on the samples they had collected, they should realize that is altered by a chemical compound and the effects it has on people's health.

English language activities
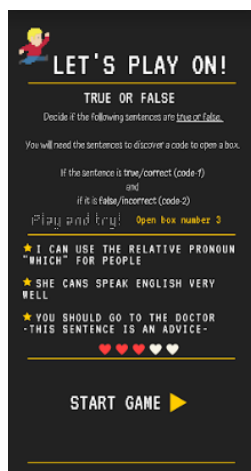
True or false activity with a code.   Ordering a story in a coherent way
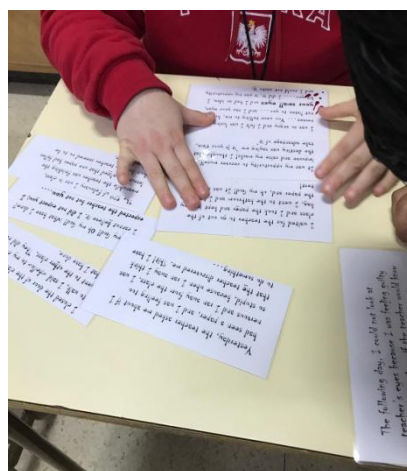
Activity number 1: Comprehension of all the instructions, rules, introduction and clues were written in English *(see appendix 7):*

Activity number 2: True or false activity with a series of sentences in which the students created a code based on whether the sentences were true or false.

Activity number 3: Reading comprehension activity: the student who murdered the teacher writes a story in English that they have to search throughout the classroom, it is divided into nine pieces that they have to order in a coherent way. Throughout history, there are some underlined letters that ordered correspond to the name of a teacher.

Final stage: Reflection and analysis

After performing thegamified 'escape room' activity the three teachers were with the students sharing a time in which we shared reflections, doubts and moments of laughter. In addition, we had prepared a questionnaire that consisted of eleven open-ended questions, in which the students could express their point of view. We as teachers realized that, according to the author Posada Prieto, (2017), the success of games are based on the improvement of daily reality, the immersion in a different reality and context, the development of the participants themselves, the management of stress and frustration, the challenge, making decisions and keeping in touch with others.

Results

The gamified activity of 'escape room' in class was developed by four students from the group 1.3 that corresponds to the Scientific modality of first course of previous studies before acceding to university. They were only four students because in this semi-attendance educational modality, the attendance is very low, it is due to they are adults, most of them are working, they have dependents or have difficulties at home. Three of them were men (75%) and they are between 19 and 26 years old. Here, there are the answers for questions that they could answer by using 'yes' or 'no' and in some cases gave reasons. According to questions number 1: Have you done an 'escape room' before? Only one of them had done an 'escape room'. The following questions (number 4, 5, 6, 9 and 11) were answered positively by 100% of the participants; it can be appreciated in the blue bars where it is reflected that 4 of them (all the participants) answered in a positive way.

Bar graphic number 1: Shows the answers (nº 1, 4, 5, 6, 9, and 11) of the questionnaire.
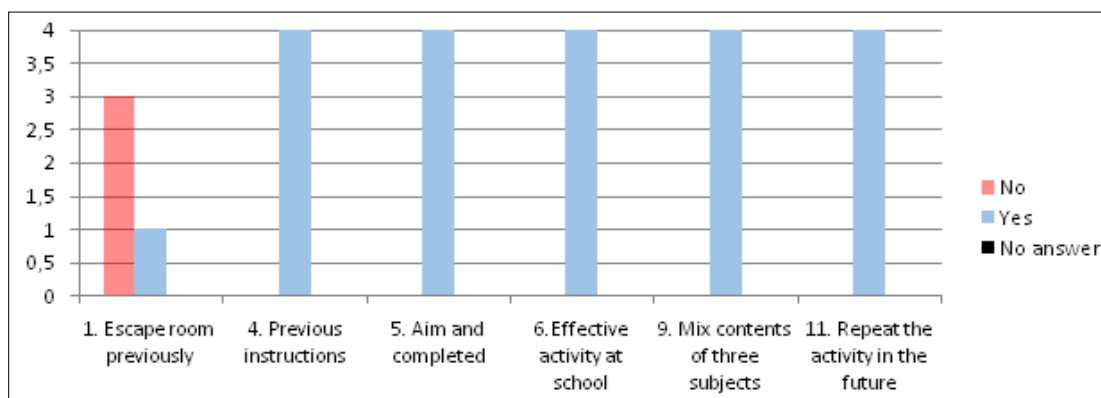
Own elaboration.

In addition, the questions number 2, 3, 7, 8 and 10 were questions in which students write what they thought and they are not possible to measure by means of a chart. However, they are very interesting to consider because they gave us a lot of feedback that will be useful for the next experience. So, in question number 2: What did you think about 'escape room' before doing it? Two of them thought that it would be like a content test of the three subjects without any help or any other type of activities or tasks, another participant considered it like a horror film and the other one did not have any idea. Taking into account the question number 3: Which feelings or thoughts do you have after doing the activity? They answered: happiness, calmed, satisfied and tired. The next question that is number 7: Which part did you like most? And the least?They liked a lot the puzzles and the identification of the cells, and they did not like the biology word search. In relation to the question number 8: It was easy to do this activity in small group or would you have preferred to do it individually or in pairs? Three of them said that they preferred in small group and one of them chose 'in pairs' but all of them considered that it would be useful in order to help each other. Paying attention to question number 10: What would you change of this activity? They said that they did not change anything but one of them asked for a break.

In conclusion, it is positive to say that the students liked this gamified experience because they were happy for doing different things to work contents at school. It is important because it gave them motivation, encouraged them to face challenges, even they improved their multitasking mind because they were able to develop different tasks and activities catching diverse details. Furthermore, the most important thing was that they were able to work as a small group without realizing it, they starting to work individually because some activities had to be done like this way, but except these activities, later they formed pairs by chance and tried to complete the tasks. If they failed or did not solve the tasks, puzzles or activities they changed themselves by the other pair, so they did not feel frustrated or stressed. Finally, they also moved on and made progress each one in their own rhythm, so they could be part of the pair and small group giving the best of him/her.

Conclusion

'Gamification' is a relatively new concept in the educational world, starting from 2002 until present a lot of definitions and variations have been added to this term. Some aspects are related to games, technology or students' motivation, 'gamification' implies to create a gameful experience, as Zicherman& Cunningham, (2011) Werbach& Hunter, (2012) as cited in Borrás (2015) explained "the game is within a circle separated from the real world, the objective of gamification is to try to put the subject within that circle, involving him". In addition, 'gamification' also needs some elements, according to the authors Kapp (2012) and Zichermann y Cunningham (2011), to develop as: an aim, rules, avatars or roles to the participants, basis of the game, atmosphere, mechanisms, a link between the game and the participants and also the digital elements could be take part in it. For this reason, we can say that we have developed a gamified experience or activity, due to talk about 'gamification' in class is very complex to achieve and

integrate all the necessary elements in the first experience. This activity was created as a tester in order to motivate students and try new contextualized activities in class.

To sum up, 'gamification' means more than doing games in class and it is different from 'game based learning' that means learning by means of developing games in class. It is necessary to include 'gamification' in class to activate students' motivation to learn in a different way, to give students constructive feedback, to offer students a more attractive learning that allows them a better acquisition, to give students exemplified situations in which they can try to solve problems, to promote competences and put in practice digital skills, to give students the decision of organizing in a task (individually, in pairs, small groups, flexible pairs/groups, etc.), and to provide students situations in which they are able to learn how to manage their frustrations, stress and failure.

Finally, according to the authors Kai Huotari and JuhoHamari (2012) described 'gamification' "as a process of enhancing a service with affordances for gameful experiences in order to support user's overall value creation". However, doing 'gamification' in class is not the perfect solve to provide students better ways of learning and it could not be successful. As other products, approaches or methods 'gamification'"can only attempt to support the user in creating gameful experiences".

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Appendix

1. 'Escape room' video: https://lightmv.com/v/8vbhfjr

2. The class: Crime Scene

3. Cards
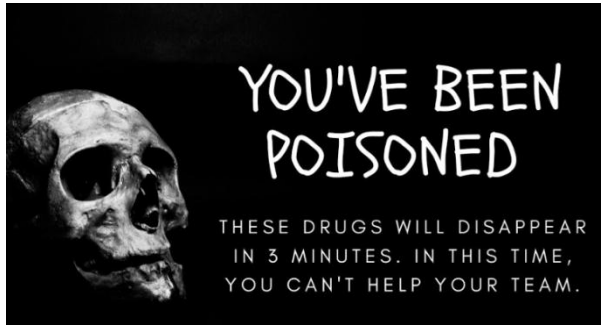
4. English activities:

True or false activity with a code.
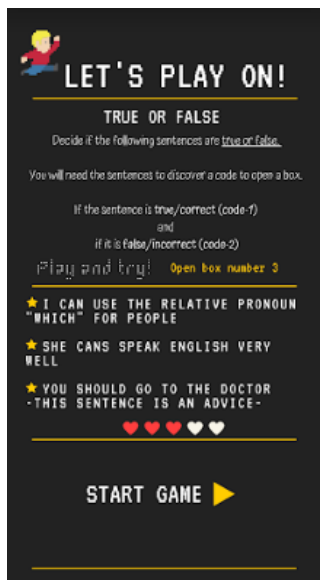
Ordering a story in a coherent way
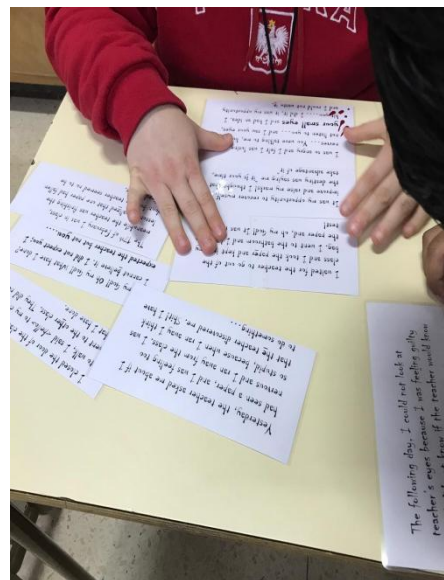
5. Physics and chemistry activities:

Plastic containers created to hide a problem inside.

Crossword of chemical elements
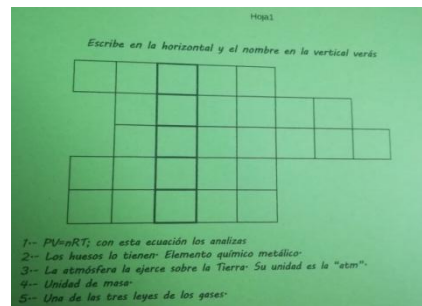
6. Biology and Geology activities:

A board of different types of cells, they had a box with questions to ask about them.

7. Clues:

8. Newspaper to contextualize the story:
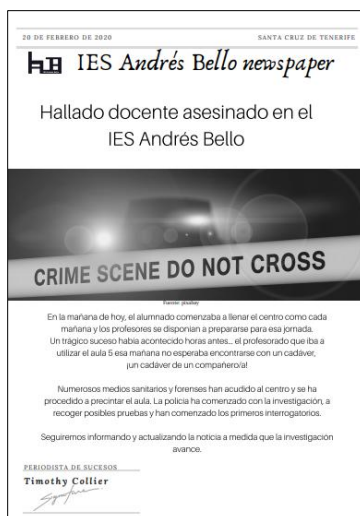
9.Teachers' ID badges

10.Students' ID badges
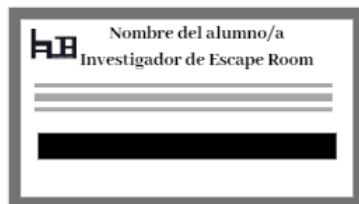
11. Boxes and locks

12. Scientific material they used to catch hints and clues.

13. Scanned questionnaires:

1.

2.

3.

4.