Research Paper

"Games for L2 Learning in a Spanish Technical Engineering Degree"

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Abstract:
In recent years, the use of ICT has increased in the education field and with that many different typesof contents have been created. One of them are educational games. However, very little research has been done to date if games are as effective as they try to be. The aim of this study was to collect information related to ICT, games and motivation in relation to L2 learning in a technical engineering degree and create some questionnaires which would then be analysed and compared with the data previously mentioned. Results show how little teachers know of the methodological applications of ICT and videogames, the benefits that they can provide to the bilingual classroom, such as motivation and how students who use games usually have a generally positive view of English learning. These results suggest that information and professional preparation regarding ICT and games have not been shared and are not mandatory, which leads to the incorrect and insufficient use of the resources. However, it would also be needed a study in the next few years as technology is always evolving and improving. What we are using currently it will become obsolete and new methodologies will have to be created in consequence.
Keywords: *ICT, Investigation, Motivation, Videogames, Technical Engineering Degree*

I. Introduction

This paper will be an investigation about the use of games in the engineering classrooms, the different types that are currently available, to show if those games could be used to learn or reinforce a new language and if they are truly effective. Current times require current actions, and of course teaching needs to be updated as well. There have been several improvements in the last few decades, such as TPR or other methods that allow the students to participate in their learning, and most recently the use of ICT inside the classroom. This brings new opportunities to teachers as this technology grants them the opportunity to teach a subject in a new and more interactive way that will catch the students' attention and make the learning more meaningful.

Games have been used inside the classroom for a long time to reinforce content or to introduce a new topic as it is entertaining for the students. With the introduction of ICT, the quality and quantity of games that can be brought to the class has increased. There are a lot of games and resources that can be found on the Internet for different topics, but are all of them really useful? Which ones are really effective and where can one findthem? What is the difference between game-based learning and gamification? Those are thequestions that this paper will try to answer.

The main objective of this paper is to demonstrate if game-based learning would improve students' learning and their motivation in the Technical English subject as current classrooms possess the materials to allow this type of learning. Those are the ICT, for example tablets, smartboards, computers, internet connection, etc.

The secondary objectives that will be used to develop this paper are to convey the importance of the materials used in class in thestudents' learning process and how those materials can impact in their motivation; to study the gamification process and its application inside the classroom using different tools; to present the pros and cons of using games inside the classroom; and to show the knowledge that teachers have of ICT and its uses inside the class.

II.   Theoretical framework

In our current era, everything is constantly changing, from the most basic things like the transportation to how we can communicate thanks to the use of technology. Each day is different from the previous one and it affects our society as a whole. The teaching method has to be constantly updating so that it does not become obsolete. Traditional classes where the teacher only gives information and the students copy it are not the only way students can learn. They can also benefit from other tools such as audios, videos and games thanks to the possibilities that ICT brings.

This section will be focusing on different literature based on games and technology (ICT) that are used in the classroom, their advantages and disadvantages, how it can affect a lesson, their motivational factor and the difference between game-based learning and gamification.

2.1 ICT

ICT is an abbreviation for Information and Communication Technologies. Mela (2011) mentions how ICTs are a fundamental part in our daily lives and have made them easier. They allow the acquisition of information in an easy and fast way where neither books nor specialised libraries are needed to get what the user needs. It also allows faster communication between faraway places, which creates a more connected world.

Cabero (1998) indicates that ICTs are every technological instrument that are focused on the information and discovery of them. For this author, the main characteristics of ICTs are their immateriality, interactivity, ability to interconnect, quality of the information founded there (including photographs and audios), constant innovation, speed and diversity.

Almenara et al (2007) share the same opinion in relation to ICTs, a more actualized one compared to the previous ones. They include hypertexts, multimedia, virtual reality, internet and satellite television, unlike Cabero's definition because he did not have those resources in his age. Almenara et al also mention how, thanks to the new technology, ICTs allow users to express in different ways such as visually or auditory, not only in written form.

Before the use of internet, if a parent wanted to know the reputation of a technical university to get the best one for their children, the parent had to observe the centre personally or ask other parents in case they knew someone whose child went to the college they were interested in. Now, thanks to the use of ICTs and Internet it is faster and easier to acquire the same information as previously mentioned using websites or social networks such as Facebook, Twitter, or even Instagram (Libedinsky, 2015).

Mominó & Sigalés (2016) mention how the role of the teacher inside the classroom is changing with the integration of ICTs in the classroom. Now the student is the protagonist inside the class while the teacher provides the best resources and conditions for the student to learn by their own means. The teacher shows the students how to use the ICTs so that they can learn at their own rhythm, investigating and creating new knowledge to which they can relate to. But the current classroom is not as perfect as previously mentioned. As Mominó & Sigalés (2016) alludes, our current schools and education laws are more prepared to face 20th century problems rather than 21st ones. Moreover, there is not enough data recollected to prove if they are truly efficient or just a support inside the class as teachers still keep teaching with the same methods as last century, where the teacher is the one that imparts the knowledge while the students absorb it (Mominó & Sigalés, 2016).

ICTs are still used as a support instead of innovating and using them inside the class as a main resource. One of the things necessary for this to change is the way of teaching, the pedagogy used in the centres. It is outdated, with the main focus on the materials in the book (Libedinsky & García, 2015). To apply ICTs in an efficient way, a study of the social and cultural framework is needed, together with the organisational framework of the place where it is going to be implemented. Teachers need to change their methodology and start mixing new content with ICT, fomenting participation and collaboration between each other or even between schools (Libedinsky & García, 2015).

2.2   Pros and cons of ICT in the classroom

The pros of ICTs are several. It allows everyone who has an internet connection to access any kind of information they want in seconds. This helps with individual learning, as students can review and increase their knowledge of a certain topic whenever and wherever they want. It also allows e-learning, that is, when a student, who is far from the place where the class is being given, receives education or formation of a certain topic with the help of technology (Area & Adell, 2009). This e-learning takes place in a virtual classroom where interaction between teacher and students takes place and where students can prepare and do activities related to the topic they are studying.

Table 1.

What does e-learning contribute to the improvement and innovation of education?
Ease and expand the access to education to certain individuals who cannot apply on-site.
Increase the autonomy and responsibility of the student in their own learning process.
Overcome the limitations given by time and space
Great interactive potential between student and teacher
Flexibility
Access to multiple sources of data different from the ones provided by the teacher at any given time
Collaborative learning between different cities or communities is possible

Source: Area & Adell, 2009. p 3

Carnoy (2004) shares the importance of the capacity to increase your own knowledge individually, as it is one of the most prominent competences required in this century, together with the flexibility that technology provides. As previously mentioned, e-learning allows the students to learn autonomously, making their learning process personal and creating more indeep connections with the content.

Yunus et al (2013) add some specific advantages that ICTs have when used in teaching writing and reading in L2. They mention how, thanks to the use of ICT, blogs allow a close up to real world situations and communications, having different audiences and ways of interacting with it and increasing the writing capability of students when creating high level sentences about a certain topic. This theory was tested in a research made by Kelly & Safford (Yunus et al., 2013) where students were given a forum, internet connection and a computer for 2 years. The test showed how the students' own research about the topic used influenced not only the way they wrote, but their interest in the topic and increased the effort they put while answering their peers. It has also been proved that when computers are used to assist language learning it "creates a supportive and motivating environment for learners conducive to students to work at their own pace and linguistic developmental level and enhances their independent writing skills in terms of quality and quantity" (Yunus et al., 2013:121).

For the cons, or disadvantages, ICTs require a substantial amount of money for it to work. It is usually given to the universities by the government but, in some cases, that is not enough. It can be because the money received is not enough to cover the necessary resources for the whole centre, or that the equipment is outdated and obsolete as technology evolves at an incredible speed (Mominó & Sigalés, 2016). Other disadvantages are that teachers might not have enough knowledge to use the technology provided and do not have time to prepare for it, students may not take the work seriously and might be distracted by other websites while using the computer or tablet, or not using it as it was intended (Yunus et al., 2013). It can also limit students' imagination, critical thinking and analytical skills if used incorrectly as many students tend to only copy and paste the first thing they find on the internet related to the activity they are doing (Koryuhina & Shamshina, 2018).

2.3 Game-based learning

Following the definition given by Pho (2015:1), Game-based learning is "borrowing certain gaming principles and applying them to real-life settings to engage users". That means to use different aspects such as live points, ability points, menu options, competition, etc, to the classroom to help students improve.

Figure 1: Model of game-based learning by Garris et al, 2002, p.445

Jan & Gaydos (2016) mention how 2003 was the year where game-based learning started to arise as it was an era of new discoveries, where internet started having an increased impact in the researches of new information and the social media, such as Facebook which started in that year. It was also the year that the term "*digital native*" began to be used.

Sedeño (2011) mentions several characteristics that digital natives have while learning: they get unlimited information at the same time very quickly; they can do several tasks at the same time in a parallel way, instead of one by one; they learn in a dynamic and active way; they work with ICT constantly; they can access new information whenever and wherever they want randomly and instantaneously; they learn new content to immediately apply it, not test it with an exam; they get immediate feedback in how they did something; they are in constant interaction with others using social networks.

This type of student needs an interactive and dynamic learning so that they stay focused and interested in the new content and can create meaningful information for themselves. If not, they get bored pretty easily and it is harder for them to focus on the lesson. Jan & Gaydos (2016) mention different types of games used for learning. Those are:

- **Motivational Games** which engage students and motivate them to learn new content. This type of games requires an essential aspect, that is, the fun element that videogames provide which helps the students keep their interest in what they are learning. It also helps them to be motivated as it can integrate aspects such as competition and the capacity to learn individually in their classes.

- **Drill and Practice Games** use the repetition to practice certain topics or reinforce something. They are usually used after the theory is given by the teacher, so drill and practice games can be considered as an add-on to traditional books. Jan & Gaydos (2016) also mention how these types of games are more focused on LOTS (Lower Order Thinking Skills), while HOTS (Higher Order Thinking Skills) take a step back.

- **Content Mastery Games** help master the information that a student already has. It can be done with the help of simulations with game features. They propose a challenge to the students where they have to apply their knowledge to solve the problems in an interesting and interactive way, while at the same time address several issues such as misconception.

- **21st Century Competency Games** are those which, unlike drill and practice games, are focused on HOTS and social skills integrating collaboration between students in their games. Jan and Gaydos (2016:7) mention how 21st century competency games "situate players in authentic context with genuine problems" which helps the student create a meaningful idea of an abstract skill they are trying to improve.

- **Scavenger Hunts** which are games where students have to fulfil the required task about a topic given by the teacher or another person. It is similar to the table game "Trivia" where the player has to answer several questions, but in this case related to a topic. They have to investigate in order to solve them. This type of game-based learning also foments cooperative work as students can help each other with the questions.

2.4 Gamification

Gamification is a very recent term. It was introduced by Nick Pelling around 2002 but did not gain enough importance due to the technology available in that era. It started gaining popularity around 2010 when big companies like Microsoft started creating game elements in their software and were successful (Pelling, 2011).

González (2013) defines gamification as a discipline where the main objective is to discover and analyse the components that make videogames as entertaining as they are and applying them to other places not related to games, such as companies or colleges. This definition can change but the main components of gamification are "using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning and solve problems" (Kapp, 2012:10).

Nowadays, there is a generational gap between students and teachers, as students are those known as "digital natives" while the teachers are not. Those new students have different experiences from the ones their teachers might have from their past as they have been born with technology. They require a different pedagogy as they have different learning styles and those previously used are not enough to maintain their motivation (Kiryakova, 2014).

The main difference between game-based learning and gamification is that gamification is "a system in which learners, players, consumers, and employees engage in an abstract challenge, defined by rules, interactivity and feedback that results in a quantifiable outcome ideally eliciting an emotional reaction" (Kapp, 2012:10) while game-based learning is when games are used or created fully to review or teach new content. Gamification can be used in any place that considers it correct, may that be programs, classes, companies, etc. meanwhile game-based learning is used exclusively in the classroom.

III.   Methodology

3.1 Type of investigation

This investigation will be an argumentative essay where the authors will collect data from other authors and will use that information to create our own materials and analyse them to finally compare them with the previous data collected. In this essay there will be an investigation using documents, books and articles from different authors based on the topic of gamification, students' motivation and the use of ICT inside the classroom. That data will then be used as the theorical foundation for the hypothesis that will be worked in this paper.

To verify if the teachers know the advantages and disadvantages of the use of ICT inside the classroom and to confirm if the use of gamification increases the students' motivation or not, a questionnaire will be created and given to several teachers currently working in the technical university. Some of them have used gamification in their classes while others have not yet.

3.2 Hypothesis

What this investigation wants to prove is if gamification as a learning tool for English is useful in our current days and the effects it might have in students and teachers as those last ones have to not only prepare the subject materials but also to understand and use the ICT correctly and know which games are more beneficial for what they want to achieve in class. It will also prove if the students' motivation increases while using a more interactive method which they can relate to or not.

This investigation will show if the gamification method is truly effective or not, not to prove if this method is "perfect" as it can have some disadvantages too. We want to present a different method in which technical engineering students can learn English using games as a motivational tool and also to show the advantages and disadvantages that this method can have.

3.3 Tools used

The tools used to collect the data previously mentioned were:

-           Questionnaire about ICT knowledge for teachers. In this questionnaire, the teacher will have to answer several questions choosing from 1 (not agree) to 5 (totally agree) about their knowledge of ICT, going from the basics like searching for something on the internet, to create their own materials using several programs.

-           Questionnaire about Gamification knowledge for teachers. In this questionnaire they will have to answer several questions, grading them from 1 (nothing) to 5 (a lot) about their knowledge of gamification method, what it means and its benefits. They will also have to write their answer to some questions where they will be asked if they would implement if and how would they.

-           Questionnaire to students about games, what kind of games they usually use in class, and which ones they think are better. Similar to the previous ones, they will be given several questions and they will have to write their answers.

IV.   Main findings

As previously mentioned, this paper wanted to study the gamification process and its applications inside the Technical English classroom, its pros and cons, the importance of motivation in the learning process and the knowledge that teachers have of ICT and gamification. In this framework, several topics related to the objectives mentioned were investigated. Once enough knowledge was recollected, several tools were created to recollect data. Those tools were three types of questionnaires, two of them were made for teachers meanwhile the third and last one was created for the students.

In the following section there will be a description of the teachers and students who took the questionnaire, a definition of them and an analysis of the data recollected which will be then compared with the information previously collected, explaining why the results might be like that.

4.1 Characteristics of the parties

The participants of the questionnaire are going to be divided into two parties: teachers and students. In the teacher party, a total of 5 teachers working in the technical university centre took the questionnaire. Four of them were men between the ages of 35 and 45 while the last one is a 40-year-old woman. One of them was the youngest one, only 35 years old and with one-year experience while the other were 37, 42 and 45 years old. The one with the most experience was the oldest one, with near twenty years teaching technical students, followed by the 37-year-old one with six years of experience and finally the youngest with only one.

For the students' party, different classrooms of technical engineering students were chosen. There were 125 students in the different classrooms with an average English level, and two of them with special needs. One of them had dyslexia while the other had trouble learning so the content was adapted. Due to the situation we were in (Covid-19), the data collected from them might not be the most accurate, but it will be considered when

analysing the data.

4.2 Descriptive analysis and main findings in the ICT questionnaire

This questionnaire was only given to the teachers. This questionnaire consists of 20 statements to which they have to cross the number they consider most correct for themselves.One would be for completely disagree while five would be for completely agree. The statements used in this questionnaire are centred around the previous knowledge of ICT,the technical and didactic knowledge of it, the interest and motivation to use it, how the centre uses ICT and overall rating that they would give to it. The main findings that can be found in this questionnaire were:

- All five teachers have heard and used ICT at some point in their career.
- They all use ICT in their classrooms, although one teacher added that their ICT are severally outdated.
- Three of the five teachers have great interest in learning more about ICT and how toimplement it to the classroom, while the other two are neutral.
- Again, three of the five teachers do not have enough technical knowledge of ICT. One of them was not interested at all in keeping updated, neither add software or hardware and was not interested in learning how to. Another one is aware of the importance of keeping updated with technology but do not consider it very important. The other three agree that keeping up to date in technology and how to use them correctly is an essential step in applying ICT to your classroom correctly.
- Two teachers comment how the ICT tools proportionated by the college are out of date and because of that, they are not able to use them to their full extent.
- In the overall, all of the teachers agree that ICT can be used to learn a new second language.

Several statements were given similar answers such as the use of ICT for L2 learning while in others, for example creating new material through programs like H5P, are very dissimilar and only one of them mentioned she was fully capable of doing it, while the others were capable but not sure.

A very important topic that has shone in this questionnaire is the outdated tools in technical centres. This specific con has appeared previously in the disadvantages of ICT, as ICT tools such as computers, laptops, smartboards, tablets, etc. are really expensive, and technology is constantly upgrading, so a digital tool that has five or more years is outdated and needs an upgrade or it stops working.

4.3 Main findings in the gamification questionnaire

Unlike the previous questionnaire, this one is composed by different questions: in the first five of them, they have to choose the correct answer, the next one is to cross the number that they consider is applied in each situation and lastly answer the questions where the participants have to answer the questions given in a precise and short way. It was given to the same teachers as the previous questionnaire.

Now, for the data recollected with this gamification questionnaire, the authors wanted to know the previous knowledge of the teachers about gamification and game base learning, its pedagogical uses, the frequency in which they use game or technology elements and their opinion in relation to the use of games in a classroom.

Question 1: "Have you heard about the term gamification before? And game-based learning?"

In the first question, the majority of them chose the second option (four votes), they have heard about it but do not know in deep, while the minority (one vote) has heard and knows about it. Interestingly enough, game-based learning is more well-known compared to gamification, with three choosing the first option while the other two marked the second option. This might be because the concept of gamification is more recent than game-based learning.

Question 2: "Would you be able to distinguish both terms?"

Now, once we go to the second question it is easy to see the data from the previous questionreflected in this one. Two of the teachers could not differentiate between the two terms, while the other two could but are not certain and only one can differentiate between these two terms with ease. It was the same subject who knew about the previous two terms.

Question 3: "Do you think that the use of games inside the classroom facilitates the L2 learning?"

The third question got mostly positive responses, with three out of five to agree that games help learn a new

language by a lot, and the other two think that, yes, it helps but not that much.

Question 4: "What do you think gamification can be used for?

In question number four there is a mix of answers. Only four of the eight answers were chosen by all of them. There was no limit in the number of answers you could choose. One of the teachers chose every option in the activity. In reality,that one would be the correct one, because games can be used for everything mentioned there. In general, they think that games are great to promote critical thinking, feedback, reward effortand participation thanks to the motivation that games bring to the class. Those are the answers that most people would give without knowing much about games and their pedagogical use.

Question 5: "Have you used a game in class recently? If so, how?"

Back to choosing the best option in activity five, all of them have used a game in their classroom recently. Two of them have used it to teach new content while the other three have used it to review and reinforce previous knowledge. This last option is the most commonly used between teachers, as it is easier to find and it is an addition to the classroom, not the main point of it. Giving games a relevant part in the lesson is not something that is commonly used yet, but with the increase of the use of games in the classroom, this will probably change in the future.

Question 6: "Do you use gamification in your classes?"

For question number six, it shows how one of the teachers uses gamification daily in their classes, as they use experience points and other game contents daily in their classroom. Thiscan be a great way to increase motivation in students without the use of real-life rewards. It also mentions the problem mentioned earlier, how the majority of them (3 out of 5) do not use games to present new content, while the other two use it more than once each term.

Question 7: "What advantages and disadvantages does gamification have inside the classroom?"

In question number seven, the advantages that the five teachers shared were similar to those of activity number four, as they might have been influenced by it. Those are: improves critical thinking and problem solving; rewards effort used in problem solving; encourages participation in class; gives feedback; increases motivation in students; it is fun to use in class. Other advantages that are mentioned are their capability of adaptation and how they can allow students with learning difficulties to learn in a different way, but were not included in the list as only some of teachers mentioned them.
For the disadvantages, surprisingly there were several of them. The disadvantages that theymention are: time cost: Many of them do not have enough free time to prepare games as they need to; need to use ICT: They consider that ICTs are not completely reliable and they might fail; distractions: The students may focus more on the game than on the lesson; game addiction: Some teachers fear that a constant use of games inside and outside the classroom might cause a game addiction to the students.
Question 8: "Do you think gamification can be used daily in class?"

In question number eight the reliability of ICT comes back. Four of five teachers consider that ICTs in their centres are not reliable enough to focus an entire lesson around them. The last one, while thinking that they could be and can be used daily in class, admits that in several occasions there were some technology problems that made impossible to use them and had to change the lesson and do "Plan B"

Question 9: "What games do you use or can be used in class?"

Question number nine is one that was interesting to see. In this one, the teachers had to writewhat kind of games they know about and are using or used in their classrooms. There are several that are more commonly known but others that are not so easy to see. All of the games cited are the following ones: Kahoot, Class Dojo, Moodle, Socrative, Quizizz, EducaPlay, Hot Potatoes.
None of them are using real games but educational games created specifically to use in the classroom. This makes it easier for the teacher to use but it can also bring monotony and boredom to the students as they think it is only another activity in different format, not a game.

4.4 Main findings in the questionnaire about games in class

This questionnaire was given to the 125 students of the technical engineering degree. It is made of five questions where the students have to develop their answers. It was made in Spanish to facilitate the activity. In the questionnaire it was asked the degree they were doing. All of them were studying the same degree in the technical university: 80 students were males while the other 45 were females, a noticeable difference between the two genres which is not surprising taking into account the technical nature of the degree.

*Question 1: "Do you like videogames? Write down your favourite videogame"*

In this question, students had to answer about their favourite videogame. All of the students answered affirmatively in the first question, they do like videogames, which is usual for students of their age. Now, there were several different answers for their favourite games, butsome of them appeared several times. Those were:
- **Fortnite:** A shooter game that has been increasing its popularity since its launching day (2017)
- **Minecraft:** A crafting game where you craft objects, fight monsters and create your own world. It is quite old (2011) so it is quite surprising that it is still popular between this generation.
- **Pokémon**: A classic RPG where the player collects monsters called Pokémon and fights with other trainers to make them stronger. They did not write a specific saga.
- **Among Us:** Game online where the player, together with other players have to discover who is the impostor without dying. The player can be a crewmate or an impostor.

Some of the reasons that they give when asked why those games are interesting are the following: you can play with friends, you love the story in the game, it is never boring, the design of the monster is "cool". As we can see in the reasons provided by the students, several of these are what make a game interesting: they are motivating, entertaining, foment group work and have a story that can captivate the audience.

Question 2: "Where do you usually play videogames?"

Source: Data collected from questionnaire

Graphic 1. Platforms to play videogames
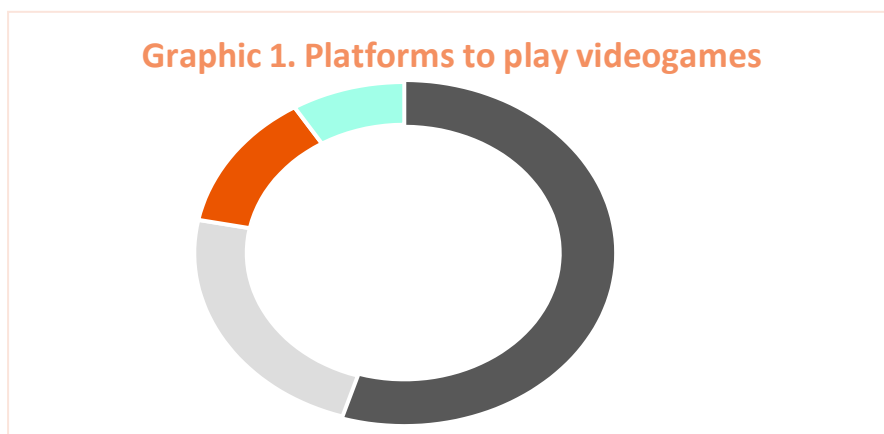
As we can appreciate in the graphic, the majority of students used the computer to play videogames, followed by Play Station with half of the computer players, then Switch and finally Smartphone. The vast use of computers to play videogames might be due to the reason that almost every house currently has a computer, may that be their parents' or the students', but a great deal of houses have one, which can be used to get information from the news, use social networks,watch a movie or, as mentioned in the beginning, play videogames.

Play Station is the next option as it has a big repertoire of videogames, for children and for adults too, so the parents can play with it too as a play station is pretty expensive. Switch and Smartphones are close to each other in number of users. It might be because the switch has less capacity or it does not have as many interesting games as the previous two options, the same with smartphone where the games on it have less quality.

Question 3: "Have you ever played a game in class? If so, which one?"

Graphic 2. Have you played games recently?

Source: Data collected from questionnaire

In question number 3 it is easy to see what was the general consensus. Yes, they played games recently in English. The game used was Kahoot as a reinforcement of knowledge given in the lesson and as a cool down activity. Some of the students added the score they got in it, pointing to the competitive aspect of the game itself. An educational game was used, one that can be adapted to whatever subject or lesson the teacher is trying to do, as they are the ones who create the game.

Question 4: "*Do you like the subject of English? How are classes usually given?" please Insert graphic 3 here]*
Source: Data collected from questionnaire

Graphic 3. Do you like English?
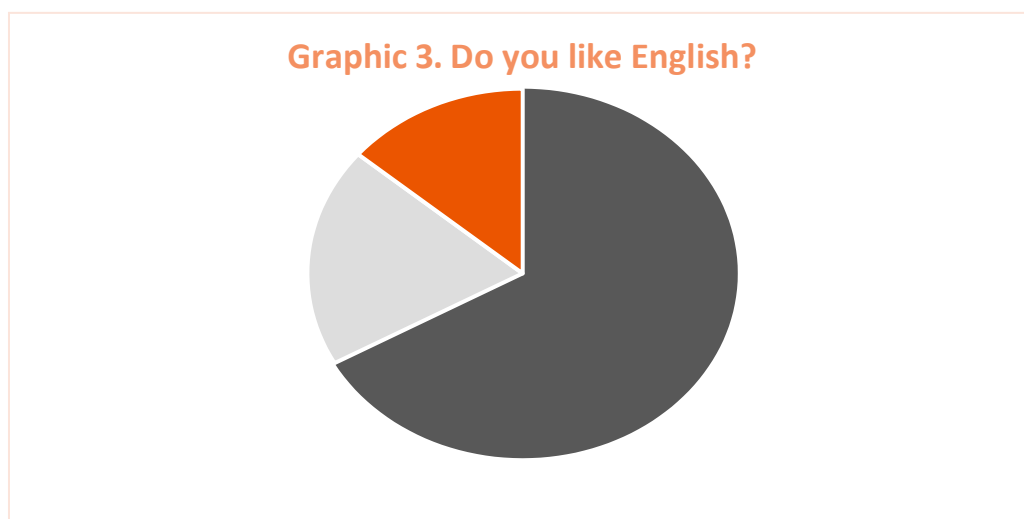
This question is really important, as it can show the motivation that students have with regards to learning English, their second language, which will affect how involved they are in their learning and how much effort they will put to overcome the challenges that the technical degree carries.

The graphic shows how more than half of the class want to learn and use English, they have intrinsic motivation, while the others who chose sometimes or no have extrinsic motivation and it depends on how the class is done. Luckily it seems that the balance is in favour of the affirmative. It might be thanks to the preparation and work done by the teachers who, with the correct use of scaffolding, resources and motivation, makes a hard lesson easier to understand. As group work is forbidden due to the pandemic, the teachers have been using cooperative games with the help of ICT as a substitute.

Question 5: "Do you think English lessons would be more interesting of games were used in class?"

This question clashes with the previous one, as they have already been using educational games in the classroom. In this question the students answered that they were already using them. Some of them would write that it would be cool to use Minecraft.

V. Conclusions

During the last two decades there has been an increase of technology advances. Computers have started to be used inside the classrooms together with other materials such as smartboards, projectors, internet connection, tablets, etc. which is also known as ICT. Thanks to this increase of ICT, possibilities that before were not possible started to be possible, for example videos in the classroom to explain something or audios to listen to songs. Another thing that has also appeared with the wide use of computers is the creation of educational videogames that were created specifically so that they can be used inside the classroom.

The purpose of this paper was to determine the effectiveness in a technical engineering degree of not only videogames, but also ICT and how it can affect the students and the teacher. To do this, a collection of information was made and several questionnaires were created which were given to teachers and students and analysed to compare the data recollected. The results taken from the questionnaires were as follows:

- The sample of teachers who took the questionnaire had a variety of opinions regarding ICT and videogames.
- More than half of the teachers did not have enough technical knowledge regarding ICT or were not interested in improving their technological abilities.
- The ICT tools provided by the centres are soon outdated due to the fast release of new technological content and improvements.
- They use ICT in class daily in the form of projections, videos or games.
- Teachers were not aware of the different definitions of gamification and game-basedlearning.
- They also did not use games in their full pedagogical capacity and were not aware ofother uses they could have.
- Most of them do not want to use ICT or games as a main component of the lesson as it requires a long time to prepare and can fail due to bad internet connection.
- The games that teachers mainly use in the lessons are educational games.
- Students feel motivated when learning L2 with the help of games, scaffolding and correct difficulty of the lesson
- Students mainly use computers to play videogames, which can lead to side tracking when working in other projects such as investigation or presentations.

Something to emphasize after collecting data about ICT and videogames is how little it is known about them. There are many ways in which a videogame can be implemented in the classroom and studies have been made to show what type of game should be better depending on what the teacher wants to use. Even with that, almost no one knew how to implement real videogames into lessons effectively, as they did not seem to fit with anything. It is also not as widely known how videogames can have a positive effect in students, as seen in studies such as Salminen & Ravaia (2008) or Granic, Lobel & Engels (2014).

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