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Master Thesis

Improving ICT Learning Experiences through Gamification

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Abstract

This thesis is mainly focused on investigating the difficulties experienced in ICT lesson, especially while teaching theoretical topics. As it is known, in some theory courses, students can be bored, and it is difficult to attract their attention. To prevent these concentration losses, what teachers need to do is to make the lessons more enjoyable. One way to make lessons more fun is to use gamification. Different topics can be explained more effectively through different games. These games can be played on a computer or in a classroom environment.

The main objectives of this thesis are to analyze the direct impact that gamification has in increasing students' motivation as well as exploring the most suitable games that could be later recommended to the teachers for future uses. Academically, on the other hand, the results derived from this paper will help teachers to have a clearer view regarding the use of games in their classrooms as well as future researchers who may get this study in national level.

Regarding the methodology, two different methods have been used: descriptive and empirical methods, with the latter consisting of both qualitative and quantitative methods – mainly tests and questionnaires.

Keywords: gamification, hot seat game, badges, learning management system (LMS)

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Introduction

Imagine that you are a student and think of a lesson. The course content is based on theoretical knowledge, while the course materials are only notebooks and books. Even when you imagine this traditional system starts strangling you. Now you are a company employee and you repeat routine work every day on the same standard. Whatever you have done yesterday, today and tomorrow it will always be the same. Isn't your work environment "monochrome gray"? And you as a smartphone user, besides the content, what are the motivating elements in the application when you download and install to your device? Colors, action, fun, gamification. Gamification is a new and effective alternative to be carried out in many areas from education to marketing.

If we look at Google Trends, we see that the term gamification emerged in 2010, and the interest continued to increase till now.

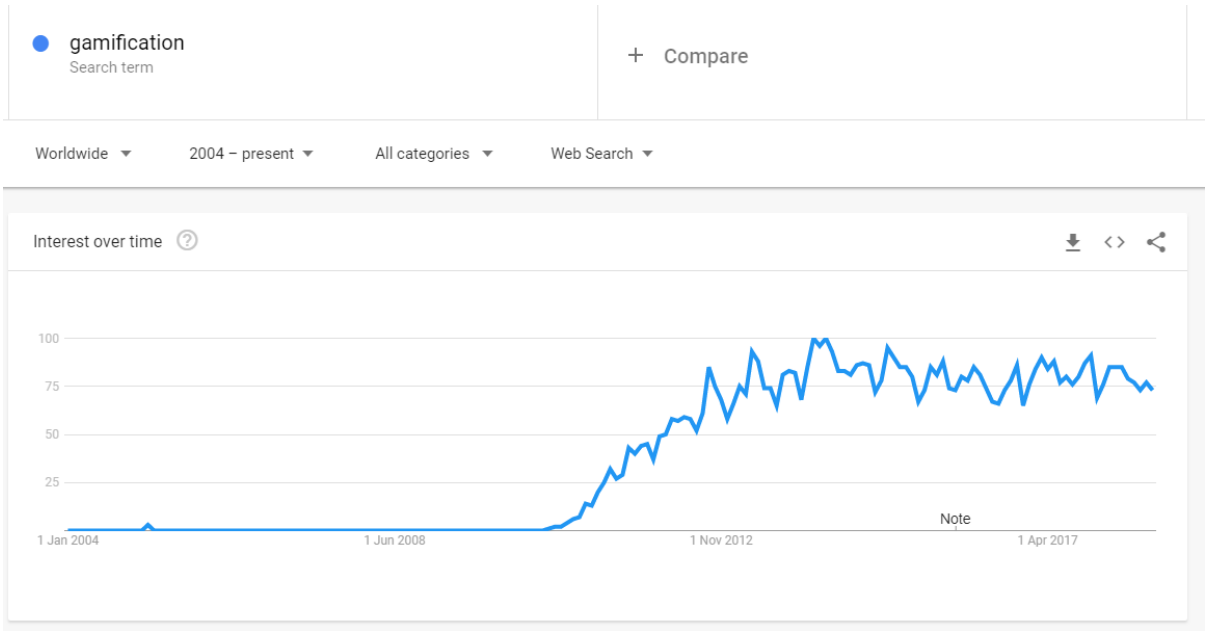

Figure 1 - Gamification term in Google Trends interest over time

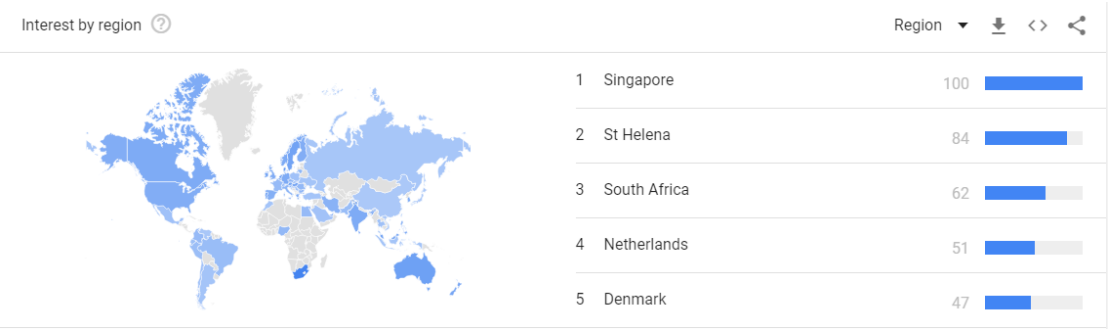

Figure 2 - Gamification term in Google Trends interest by region

Structure of the thesis

1. **Introduction** gives an overview of the whole thesis. Firstly there will be general information about gamification. What is gamification; in which fields and how it is used; etc. Then it will focus on how gamification can be used in ICT lessons.
2. **Literature review** analyzes previous researches about "Gamification in Education" and especially "Gamification in ICT lessons" in details, in order to look at the research from a broader perspective.
3. **Methodology** chapter will be the initial part that justifies the theoretical approach part of the study. In the same chapter what follows will be the methods section. That is the physical 'doing' part of the study (sampling, data collection). The methods that have been used in order to check the effects of gamification in ICT lessons in different circumstances will be explained.
4. **Results and Discussions** chapter is the main chapter where the results will be listed. We the results from the researches will be analyzed and explained. The results will be explored with some tables and charts, also some comparisons will be made with the collected data. In this section, the results will reviewed and re-stated in more clear language, and contextualized in terms of whether they support the hypotheses or not. Finally, the main question will be answered and explained how the conclusion is reached.
5. **Conclusion** part presents a summary of the thesis. The reflection, limitations and future areas for this research are also included in the chapter
6. **References** used for completing this research.
7. **Appendixes**

Research Aims

The aim of this thesis is to investigate the difficulties experienced in ICT lesson, especially while teaching theoretical topics. As it is known, in some theory courses, students can be bored, and it is difficult to attract their attention.

To prevent these concentration losses, what teachers need to do is to make the lessons more enjoyable. One way to make lessons more fun is to teach the students with games.

Different topics can be explained more effectively through different games. These games can be played on a computer or in a classroom environment. In this thesis, some of the games that can be played to teach ICT lessons more effectively will be explored.

If you are a teacher, you can create bonus points for daily assignments, performance assignments, project submission or classroom activities; you can attach badges at the end of the month and share the annual scorecards with the class. Motivating the student through the elements of entertainment and competition is inevitable.

The idea of using games to engage students in the process of active learning is not new. Over the past several years, educators have been increasingly incorporating various games into their teaching curriculum to create a fun and engaging learning environment for students. Although this can be very challenging and time consuming, interactive, collaborative and competitive games tend to motivate and encourage student participation in the learning process.

As it is known, in some theory courses, students can be bored, and it is difficult to attract their attention. To prevent these concentration losses, what teachers need to do is to make the lessons more enjoyable. One way to make lessons more fun is to teach the students with games. Different topics can be explained more effectively through different games. These games can be played on a computer or in a classroom environment.

In my classroom, it was conducted several games with my students to review previously taught material and to prepare for tests. It was noticed that most of my students tend to enjoy hands-on activities in courses; however, I wonder sometimes when we play

games or do activities if they are grasping the content of the material in the process. The feedback that was received from students regarding the benefits of the review games we play has been positive and many students suggest playing them more often.

There are many explanations as to what defines a “Gamification” nowadays. Regardless of the format of the game, students can simultaneously build their problem-solving skills while having fun throughout the gamification process if a game is well-designed.

The following table lists the differences between an actual game and gamification of education:

Game	Gamification
Games have defined rules & objectives	May just be a collection of tasks with points or some form of reward
There is a possibility of losing	Losing may or may not be possible because the point is to motivate people to take some action and do something.
Sometimes just playing the game is intrinsically rewarding	Being intrinsically rewarding is optional.
Games are usually hard and expensive to build	Gamification is usually easier and cheaper
Content is usually morphed to fit the story and scenes of the game	Usually game like features are added without making too many changes to your content

Figure 3 - The differences between a game and gamification

According to Gabe Zichermann, cited by (Giang, 2013), using game mechanics, we can improve the abilities to learn new skills by 40%.[1] With the help of games, the commitment and motivation of users can be increased to higher levels in the activities they are involved in. The difference between "Gamification" and "Games" is that gamification is the use of game thinking, approaches and elements in context.

Kebritchi poses the concern that games are becoming such innovative learning tools that teachers may conclude that they don’t need to lecture, and instead they may “rely on the game and use it as a teaching replacement and not as a supplement”. It is important to

[1] Vivian Giang (2013). 'Gamification' Techniques Increase Your Employees' Ability To Learn By 40%

remember that games are supplement teaching tools and teachers ultimately need to be actively involved for them to be truly effective (Kebritchi, 2010).[2]

Research Questions

- Does gamification have an impact on students' motivation?
- How should gamification be used appropriately in ICT lessons?

Research Hypotheses

- Gamification can increase student engagement and participation in lessons.
- Gamification can increase teachers' motivation in lessons.
- Gamification can increase the interaction between students and teachers positively.

What is gamification?

Gamification concept is totally different than the game concept. Gamification is integrating game design elements on platforms that are not designed as games and motivating and encouraging learners/users to solve problems with the help of these designed games.

As gamification expert Yu-Kai Chou stated in his TED talk "Gamification to Improve Our World", the concepts of PBL (Points, Badges, and Leaderboards) lies on the basis of gamification.

The goal is to make use of the points used in games, badges, and leadership, as well as the use of digital game design techniques, including education and the business world, to make them entertaining, interactive and engaging.

According to Yu-Kai Chou, gamification is the craft of deriving all the fun and engaging elements found in games and applying them to real-world or productive activities. This process is "Human-Focused Design," as opposed to "Function-Focused Design." It's a

[2] Mansureh Kebritchi (2010). Factors affecting teachers' adoption of educational computer games: A case study

design process that optimizes for human motivation in a system, as opposed to pure efficiency.[3]

Hot Seat Game

What is "Hot Seat Game" and how is it played? First, the class is split into teams (the best is 2, but also it can be divided into more). The desks are divided, and then the groups are placed on the theme. In front of each group a chair is put where one member of each group will sit. The group will face the table, but the member in the chair will sit with his face to the group so that he can't see the board. All the groups will be in this position. The teacher will have made a list of words. He / she chooses one of them, writes it clearly on the board, and all the groups will try to describe this word to the member seated in the chair, but only using synonyms, antonyms, definitions etc. The one from the members seated in chairs who says the word first, his/her group wins 1 point. The members seated in chairs change their places with other members from their group, and then another word is written, and the game goes on like this.

Badges

Students can be motivated for different reasons, in different ways. However, most people find encouragement from recognition of their achievements. Badges are a simple, visually appealing and effective way to recognize these achievements, as well as a way for students to share and analyze the development of their abilities and learning with their peers.

Training is more effective when individuals are motivated to learn, share, interact, and team up. Badges can be issued to students for effectively participating in a course and showing certain abilities, thereby encouraging these behaviors. Badges can add a level of gamification to your learning environments.

Using Badges Effectively

As one of the key stakeholders involved, telling students how badges work and how they may earn and show them is fundamental to the success of any implementation.

[3] Yu-kai Chou: Gamification & Behavioral Design

Providing an initial badge for a simple task, for example adding a picture to their profile to get students started with badges, along with a guide to where and how they can be shared, will go far to exhibit the badging procedure.

Teachers can use a range of badge types to help keep students engaged in the badging process. Given that badges can be connected to gaining skills or knowledge, or completing assignments, they have the chance to offer a variety in how badges are awarded and used within the system.

The badging process can be an exciting process across the students and teachers. Besides offering great looking, meaningful badges, one of the most ideal ways to do this is by tapping into the competitive spirit of the students and teachers.

Badges displayed within student profiles and badge leaderboard posters are an incredible method of encouraging others to earn badges.

Literature Review

The advance of technology has made it possible for the teachers to gradually stop using conventional ways of teaching and start using more conventional teaching methods within the classroom. Instead of the traditional ways of teaching, which have dominated throughout the best part of the twentieth century, many institutions around the world are trying to employ new and more efficient techniques with the aim of getting their students more motivated and interested towards the lesson and thus increase their overall performance. One of the most important factors that contributed to the realization of this ultimate objective is the implementation of unique and fitting methods and techniques.

Modern Teaching Methods

Schools across the world function in an extremely multicultural society thus harnessing technology as part of daily life is a continuous process. In today's conditions of the rapid development of our society and the accelerated growth of information, traditional teaching methods, which are teacher-centered, could not answer most of the new developments. So today, in all levels of education, unorthodox new methods are being used with the aim of putting the students in the center of the classroom with the teacher being the organizer of learning. It goes without saying that this implementation of the new teaching strategies has required some changed methods which are in line with social, economic and political developments.

While teaching is very important the selection and use of methods that will be used are more important. The teacher should make learning as interesting as possible and have a dynamic class because if the teacher always uses the same teaching methods the process becomes monotonous and students leave interest for new knowledge to be taken. That's why the modern teaching method is much better than the traditional teaching method. Students are free to express themselves, are free to discuss matters with each other and to work and share their knowledge's in groups and individually. Methods and techniques of discussion and working groups have special significance and aim to teach students lifelong learning skills. Developing critical thinking has a great influence on how students process information, solve problems and cooperate with each other. Another important factor that is indispensable when it comes to the perfect implementation of the new strategies is the

realization of new lesson plans which, according to several leading researchers of the field, must be comprised of at least three phases:

- Evocation
- Realization of meaning
- Reflection

The first phase – evocation – is conducted with the aim of eliciting information that the students already know. After the teacher has extracted the required information, they proceed with the development part of the lesson, which, as everyone would agree, is the most important part. Finally, the last phase that must be included in a lesson plan is the reflection part, which is supposed to come as a recapitulation of the lesson developed within a lesson hour. The gamification, which will be further elaborated in this section of this thesis, can be implemented in all the three phases of the plan.

Motivation

One of the teacher's main responsibilities is to keep their students motivated and engaged in classroom learning. However, this tends to be one of the most difficult tasks for teachers. Several researchers have worked on this specific issue and luckily, they have managed to bring up several teaching techniques and several tips on how to increase students' motivation in the classroom. Teachers, more than anyone, have the most power to know how to motivate pupils because they are on the front lines. All teachers should ask themselves is: are my students bored? Are they falling asleep in class? The answers to these questions should help them find out some methods to avoid these bad habits of students. The best way to do it is to motivate them. There are a lot of ways to do it.

If motivation has a starring role in every aspect of our teaching practice it is relevant to define what motivation is. According to Kleinginna, JR., & Kleinginna A., "Motivation is an internal state or condition that activates behavior and gives it direction". They further argue that for a student to be able to understand something, they must first be interested in it. Therefore, before teachers even start presenting their lesson, they must be sure that the majority of the class is willing to listen and get engaged in the lesson. As we can see, Kleinginna, JR., & Kleinginna A. (1981) argue that motivation is the prerequisite for a

successful teaching and learning process, especially when it comes to certain fields that are considered boring to be taught.

Ur, on the other hand, argues that practice helps more than traditional exercise. Even though they are very useful, they are not enough. Motivation is a state that energizes, directs and sustains behavior. Motivation requires goals and involves activity" (Ur, 1999). So, according to Ur, for a student to be motivated, they must be kept active through different activities.

Motivation is believed to provide a solid impetus to initiate learning and at the same time, is thought to be a driving force to continue the long, often tiring process of learning. Motivation is not static but progressively changes as a result of several factors such as the teacher's behaviors, type of activity, the subject, etc.

Motivation factors can be divided into two groups, extrinsic and intrinsic. Malone and Lepper have been focused on distinguishing between extrinsic and intrinsic motivators. "Extrinsic motivators are considered to be independent of the instructions and have no relationships that are direct to the content of the lesson" (Malone & Lepper, 1987). According to them, extrinsic motivators work as simulators that help students acquire knowledge, regardless the fact that these simulators are not related to the topic.

Crookes and Schmidt, on the other hand, state that "A variety of classroom activities is one factor in nurturing intrinsic motivation. It is important to change intrinsic motivators from time to time, this happened because individual students respond to different ways of motivation, requiring a certain amount of individualization" (Crookes & Schmidt, Motivation: Reopening the Research Agenda., 1991). This sheds light to a very important issue that is the fact that no human being is the same thus each student deserves a different approach when it comes to motivation. Alessi & Trollip recommend certain techniques to enhance intrinsic motivation. They list some of these techniques:

- Use game techniques
- Use embellishments (such as visual techniques) to increase learner intensity of work or attention and to encourage deeper cognitive processing
- Use explanatory environments

- Give the learner personal control
- Challenge the learner
- Arouse the learner's curiosity
- Give encouragement even when errors are made

The good news about these techniques is that they can be implemented in different ways and it is up to the teachers to decide which of the techniques they prefer to use. All of them have been proven to have helped in increasing students' motivation. Another important fact that has to be mentioned is that different gamification approaches are comprised of most of these techniques.

Anthony D. Fredericks, another leading researcher in this field, provides a list of several things that, according to him, should be done by the teachers in order to maintain students' motivation and desire to learn.

Keep Students Active and Engaged!

"When students are interacting and engaged, they won't have time to get bored. Pick students randomly to respond to questions, and make it understood that you value their input and thoughts. Student interaction and sharing improves instructional time and prepares students to work more effectively as a body of learners. We must know the importance of these elements and discover ways to celebrate student intelligence." (Fredericks, 2005).

Allow for Creativity and Variety

Assigning a piece of writing? Enable students to choose their own genre—such as reports, poems, creative writing stories, plays, or songs—when assigning a topic. When students can pick their favorite form of writing, they'll stay intrinsically motivated. (Fredericks, 2005)

Get Out of the Classroom

Holding lesson or even a short discussion in a different environment, whether a park, museum, or the school library, is a great way to improve student interest. When you return

to your classroom, they may see a new approach to a problem or assignment (Fredericks, 2005).

Create a Competition

Participate in a competition. As long as there is appreciation for everyone's best effort and not all attention is placed solely on the winner, a competition can be a great way to create excitement (Fredericks, 2005).

Offer Differentiated Instruction

Knowing that you'll have students of differing abilities in your classroom, craft your lessons for everyone—taking into consideration the different ability levels (Fredericks, 2005).

Provide Feedback Promptly, Frequently, and Efficiently

Students must be able to observe a direct connection between any effort or completed task (such as homework) and a response from you, both verbal and written. Make sure you notice each student's personal progress, instead of comparing his or her work with others in the class. (Fredericks, 2005)

Provide Multiple Opportunities for Students to Set Goals

Students should have multiple opportunities to set their own academic goals. Invite them to establish obtainable goals for a lesson, a unit, or even for the whole year. Ask them what they want to learn about a topic and what they think they must do to learn that material. Psychologists tell us that the goals we set for ourselves (as opposed to the goals others set for us) are intrinsically more motivational. We're more inclined to pursue those goals and relish in the success that comes about when we achieve them (Fredericks, 2005).

Start the Day with Fun

Start the day off on a lovely note: a funny video, a random question, or fun fact will help students see the entertaining side of learning (Fredericks, 2005).

Share Accomplishments

Provide various opportunities for students to share their accomplishments with their classmates and the class to share their achievements with the larger school network. Use skits, plays, readers' theater productions, library displays, bulletin boards, a class newspaper or newsletter, or other media to promote the efforts of the whole classroom. (Fredericks, 2005)

Reasons to use videos in classroom

There is a need to include a tool that would catch the attention of the students. Introducing movies, videos, video games among other entertaining audio materials, into the classroom is something the all teachers might want to do as part of their lessons. According to Wright many media and many styles of visual presentations are useful to the learner. That means that "all audio materials have positive contributions to learning as long as they are used at the right time and the right place" (Wright, 1976). In the process of learning, the learners use their eyes as well as their ears, but their eyes are more important than their ears in the process of learning. The materials for students are always adapted to the level of the learners.

Another author that is interested on visuals as the main factor in the learning process in Mayer (2001), who tells that "viewing, although it may appear to be passive, can involve the high cognitive activity necessary for active learning. The content and context of the viewing are both crucial components for engaging students as active learners" (Mayer, 2001).

Using game-like activities in classroom

The use of games within a classroom has somehow turned into a conventional approach since a huge number of teachers tend to make use of games in order to increase the motivation and the productivity of their students. An important research on this regard has been conducted by Amy Talak-Kiryk who in her research "Using Games in Classroom" argues that games are a very important tool in teaching.

What is a game?

"Games are fun activities that advance interaction, thinking, learning, and problem-solving techniques. Often, games have an aspect that allows the players to produce information in a short time period. Some games require the players to engage in physical activity and/or complete a mental challenge" (Talak-Kiryk, 2010).

Why should games be used in classrooms?

"Games are effective tools for learning because games offer students a hypothetical environment in which they can explore alternative decisions without the risk of failure. Thought and action are joined into purposeful behavior to achieve a goal. Playing games teaches us how to strategize, to consider alternatives, and to think flexibly" (Martinson & Chu, 2009)

Games provide a constructivist classroom environment where students and their learning are central. Learning through performance requires dynamic discovery, analysis, interpretation, problem-solving, memory, and physical activity and extensive cognitive processing. Students draw their own meaning from these experiences while learning from their mistakes and from one another. The students also build upon their previous knowledge and use their new knowledge in a circumstance separate from the activity in which they learned it. Besides, the teacher is now able to make observations on each student and see what areas the class or individuals are struggling with or excelling at as well as the social elements of the group. Montessori classrooms are famous for implementing constructivism effectively. Their teachers are prepared in theories which promote learning through experience. They remind us that when little children learn, trial and error is a part of everyday life.

Since each game has a particular learning objective in mind, every player's turn deals with the same concept or skill in a different way. Therefore, what students do not learn on their own turn, they may get a handle on from someone else's turn. In addition, the responsibility for learning and practicing is the job of the student and it is willingly accepted.

This can especially be said about the environments where students have more access to technology, such as ICT classrooms. One of the most common techniques when it

comes to teaching ICT in unorthodox ways is incorporating different aspect of gamification. Consequently, an increasing number of researchers have begun dealing with the impact that gamification has on increasing students' motivation and thus their overall performance in different lessons.

One of the most renowned researchers of the field, Yu-kai Chou, in his article called "Gamification & Behavioral Design" describes how to use gamification to make a positive impact on our work and life. In his research, Chou, explains the Gamification Framework called Octalysis, which he has created after more than 10 years of gamification research and study.

Chou has designed the Gamification Framework called "Octalysis" as an octagon shape with 8 Core Drives representing each side.

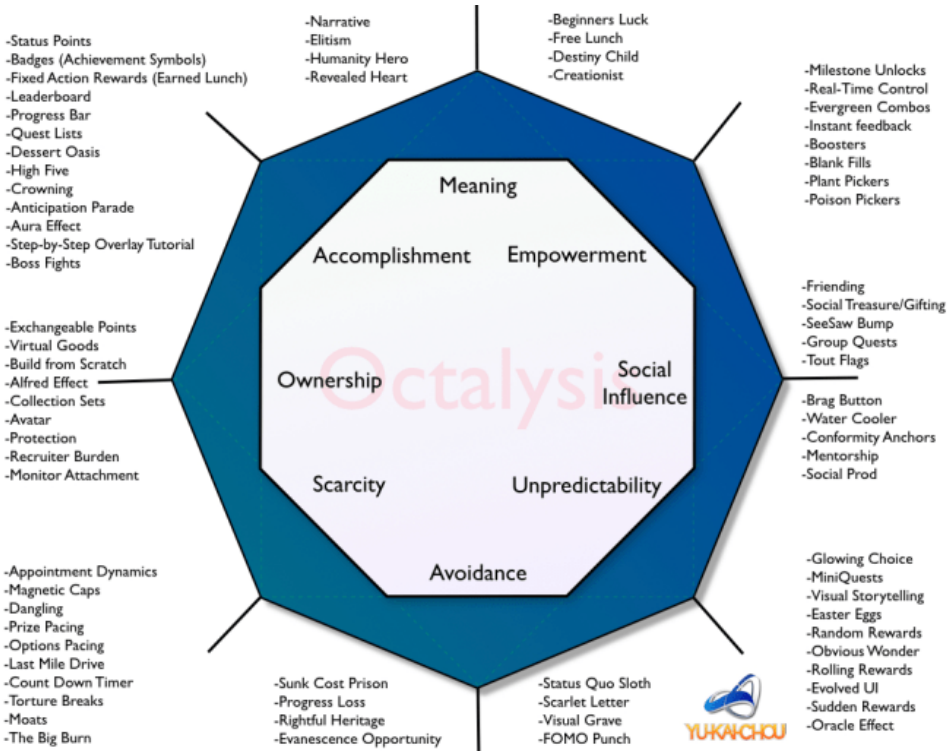

Figure 4 - The 8 Core Drives of Gamification

The 8 Core Drives of Gamification

1) Epic Meaning & Calling

Epic Meaning & Calling is named the Core Drive on which the person who plays that game has the opinion and thinking that he is doing something big, maybe something that he was "chosen" to do. A symptom of this is when a person devotes a lot of his time to maintain a forum or helping to bring new things for all the community (example: creating Open Source Projects, or, put information for helping people in pages or websites like Wikipedia, etc…). But, here also we include the effect of the "Beginner's Luck", which as an effect makes those people think that they were given like a gift, that others don't have. Also, there is another option they believe that they were "lucky", while they took a sword at the beginning of the game.

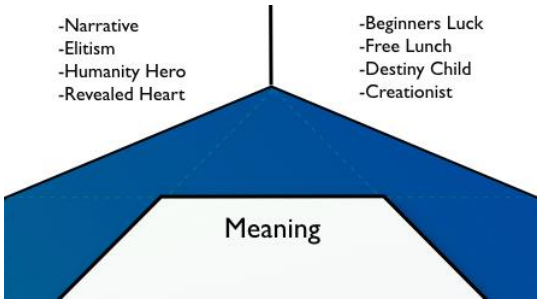

Figure 5 - Epic Meaning & Calling

2) Development & Accomplishment

Development & Accomplishment is the part on which it is made progress, get further on skills, and it can be to pass the challenge. The word we used here "challenge", has importance, it is not used as a usual word, it is used as a trophy or maybe as a medal, and, it could have no importance without a challenge existing. Also, this core drive is the one that is the easiest to design for and coincidently is the one on which most of the PBLs: points, badges, leaderboards mostly focus on.

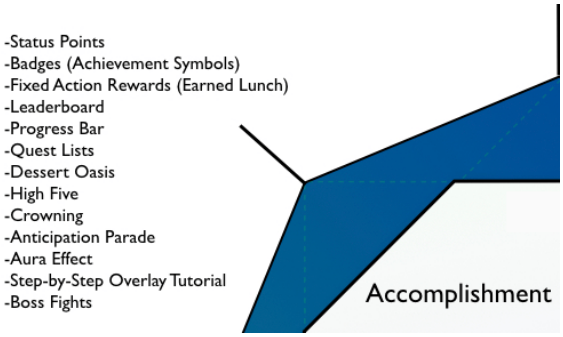

Figure 6 - Development & Accomplishment

3) Empowerment of Creativity & Feedback

Empowerment of Creativity & Feedback is when game players have continued to show their creativity in a creative process, where they must make different combinations. But they not only have to use their creativity, but they also need to be able to see the result of their "work" respectively their creativity. Also, they receive feedback and respond in turn. As examples, playing with Legos and painting or drawing are something, at real activities that do make fun in-and-of themselves, and, often become Evergreen Mechanics, where the game-designer, doesn't need to add content on it, so that it can keep the activity fresh, but, because of it, the game-designer doesn't need to worry about it.

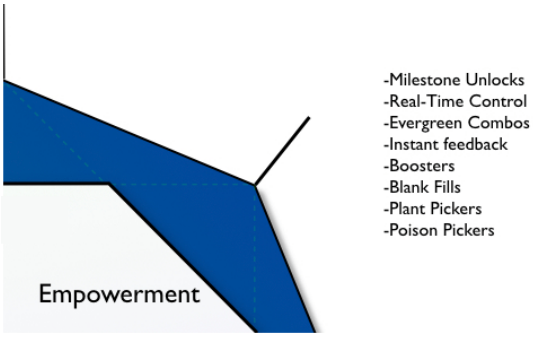

Figure 7 - Empowerment of Creativity & Feedback

4) Ownership & Possession

Above, we can see the drive where users or players as we do name them, are motivated, and the reason for this "product" is that they feel they own something. That time when the player feels ownership, he/she wants to make even better scores and own even more. Besides being the main core drive for having the feeling to accumulate wealth, this deals with many virtual goods or virtual currencies within systems. If a person uses a lot of his time to set up his/her profile or avatar, he/she directly feel ownership on it too. For the end, this core drive is the one that makes collecting stamps or puzzle pieces fun.

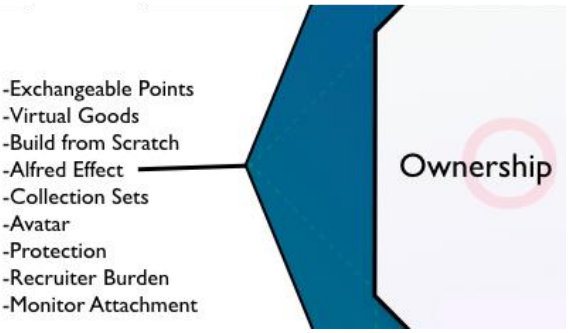

Figure 8 - Ownership & Possession

5) Social Influence & Relatedness

Figure 9 - Social Influence & Relatedness

This drive brings together all the social elements like mentorship, acceptance, social responses, companionship, as well as competition and envy. The time you see a friend showing interesting activities, or something that is not common in your society, and then you will want to be like him/her, in a way you are attracted by those interesting skills. It includes also the drive we have drawn closer to people, places, or events and organizations we can relate to. If you just see a product that reminds you of something from your childhood, probably you will want to buy it. This Core Drive is well-studied too so that many companies these days are giving a lot of importance on optimizing their online social strategies.

6) Scarcity & Impatience

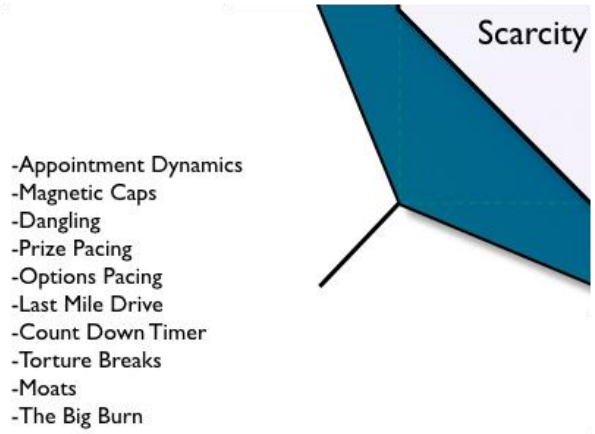

Figure 10 - Scarcity & Impatience

This one is the drive on which you want to have something that you can't have it. On many games, you see the notifications coming like "after 2 hours come back to claim this reward, or to open a new level" or something like this. This is named as Appointment Dynamics, it describes the phenomena that people can't get something immediately, and this motivates them to come back to take it, but, up to that time, they will be thinking about how to take it. This case is the same with some apps that are not available in some countries, and when they are, people rush to get it. And why? -because they didn't have it earlier. We can remember the same famous case, Facebook. It firstly was available only for Harward, then for some well-known colleges, then for all schools. Finally, when it became

available to everyone, many people wanted to join it. Again, why? -because previously they couldn't have this possibility.

7) Unpredictability & Curiosity

In general, this one is not a harmful drive. On it, it is wanted to know what will happen next. If you don't know what is going to happen, you will continuously be thinking about it. One of the reasons why people read novels and watch movies is this drive. However, this drive is also the first factor behind gambling addiction. Also, this core drive is used when a company runs a lottery program, or any game same to this, to engage users. The Skinner Box experiment, known as very controversial is exclusively referring to the core drive of Unpredictability & Curiosity. For those experiments, animals are used to irrationally press a lever frequently and having an unpredictable result. Although many have not understood it well, such as considering it as the driver behind points, badges, and leaderboard mechanics in general.

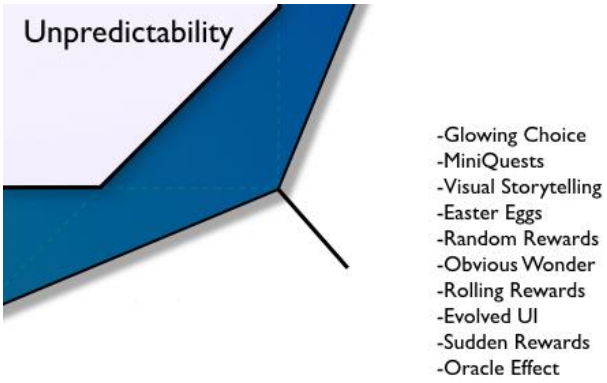

Figure 11 - Unpredictability & Curiosity

8) Loss & Avoidance

This core drive, inside of its defining, describes the avoidance of something not good or negative happening. As a small "product" of this, it could be to avoid losing previous work. But, as a larger "product", it could be to avoid accepting that everything you did up that time was for nothing because now you have paused. Also, opportunities or benefits that are "getting away" have a strong utilization of this Core Drive, because people feel like if they didn't act immediately, they would lose the opportunity to act forever.

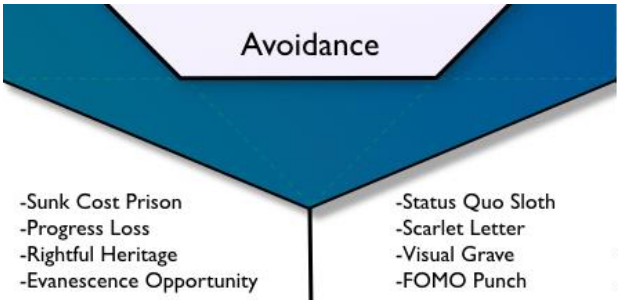

Figure 12 - Loss & Avoidance

How to apply Octalysis to actual systems

As we gave all descriptions about different terms, themes, and gamification Framework in general, the next and last step for this writing is to show how to put in use this framework. Any good product or system will have at least one of the core drives listed in the upper parts. How Octalysis is used, is to identify all game mechanics that are used to appeal to each Core Drive and list it next to the Core Drive of the Octagon.

Each side of the Octagon will expand or will not expand (will retract), based on how much strong the game mechanics are. If one of the sides, crosses the inside part of the Octagon, then, that side shows that is extremely weak and the gamification experts need to improve on that area.

Gamification in Education – How?

Gabriela Kiryakova, Nadezhda Angelova, and Lina Yordanova in their research titled "Gamification in Education" explain that the progress made for creating an effective strategy to implement gamification in e-learning hints in something from existing conditions and available software implements. The major steps include:

1) Determination of learners' characteristics

At the time when teachers want to use something new on their teaching system, they must first know students' profiles and see if it is the proper strategy for the students. The main and most important keys are taking part in a lesson in a competitive way, and, co-operate with the learning content.

It is primarily for teachers to know what skills a student must have to be part and be successful on the objective- if the task and exercises need special skills. It would have a negative income like demotivation if tasks are very easy or difficult.

The desire of students to participate or not in an activity is directly connected with the learning process and the income for them in the end. (W. Hsin-Yuan Huang, D. Soman, 2013).

2) Definition of learning objectives

The learning aims must be clear. The aim of education is to fulfill the learning objectives, diversely all other activities, also including gamification will seem insignificant.

The objectives determine what kind of content to be in the learning process and select convenient game mechanics to succeed them.

3) Creation of educational content and activities for gamification

The educational restraint must be interactive, attractive and wealthy in multimedia elements. The objectives must be progressive and allow: (Simões, J., R. Díaz Redondo, A.Fernández Vilas, 2013):

- Multiple performances - the activities must be that kind that can be repeated if students have an unsuccessful attempt. Creating junctures to meet fundamental goals has high importance. By repeating continuously, students will improve their abilities.
- Feasibility - the activities must be achievable. They must be proportional to students' potential and skills.
- Increasing difficulty level - each step will be more complex and connected to their new knowledge and skills.
- Multiple paths - to get different skills in learners, they must be able to get in the end by not the same paths. By this, they can create their plan on their own, which is a key to active learning.

4) Adding game elements and mechanisms

The key element of gamification is the comprehension of tasks that students need to perform. The performance of tasks leads to accumulation of points, transition to higher levels, and winning awards. Those actions are aims to achieve predetermined objectives. What kind of elements will be part of training is connected with determined objectives (the knowledge and skills that will be gained as a result). Activities with self-work, bring personal award. Other activities need co-operation, they make students part of a big learning community, and results are public and visible (W. Hsin-Yuan Huang, D. Soman, 2013)

Software Tools for Gamification

As there are many tools of gamification, we have from these that don't require installation (are web-based), and you can access them from any location. Some of the most known tools are Socrative, Kahoot!, FlipQuiz, Duolingo, Ribbon Hero, ClassDojo and Goalbook.

BadgeOS™ and its add-on BadgeStack, is free and can be used as a plugin in WordPress.

Mozilla Open Badges Project's aim is to "put" students out of classroom learning type-as informal learning. By it, everyone can make wins and badges with technical infrastructure.

Gamification and LMS

Educational institutions use LMS in different ways for their needs. It allows the integration of Web 2.0 tools and makes effective ways for necessary collaboration between all participants. Because of owning automatic tools, LMS are suitable environments for gamification. It is possible to retrieve data about the time that students spent for viewing and interacting with content. Learners are encouraged to be active in many fields by creating wiki pages.

Parts of LMS now have new functions related to gamification, such as Docebo offers Gamification App from where the administrators give badges for winners who complete different activities inside LMS. (Docebo Help & Support).

Accord LMS offers many opportunities such as leaderboards and badges reward students' contributions. (AccordLMS).

By blackboard students earn the recognition needed and teachers give badges to them for solving different issues. (Blackboard)

Gamification in Moodle

Moodle is an online platform that allows teachers to manage online learning. It is used to lighter gamification of the learning process.

Some of Moodle gamification capabilities are (Muntean, 2011), (Henrick, 2013):

- User's picture/avatar. The user can upload a photo or avatar to their profile.
- Visibility of the students' progress. Correction of small mistakes that aren't taken seriously can bring "workers" to a better point. Tracking progress is possible (option Completion tracking).
- Display of quiz results. The results can be obtained directly from the system.

- Levels. The level up! There is a possibility to display the ranking of students, respectively the criteria for each level.
- Feedback. Giving an “answer” for positive or negative things after a session is finished.
- Badges. Given to learners for passing a level or solving a problem.
- Leaderboard. Allows and shows the leaderboard of students based on their points. Students can see where they stand and compare their results and achievements to their colleagues. In a way, there is created a competition.

As more, Moodle supports conditional activities in restricting access to learning in e-courses. Ex; Students must meet criteria to be part of an activity. Conditional activities create prerequisites to set learning objectives so that students achieve them and continue to the next one.

As ending, there are many ways of putting gamification in Moodle. The system features-base of gamifying by processing automatic data, tracking the progress made and achieve in conditional activities.

Methodology

Selecting the right research method is crucial for every research done. The selected method further defines the flow of the research, the data input and output, the analysis and the results as well. There are four main research approaches (Center, 2008):

- Qualitative research methodology
- Quantitative research methodology
- Correlation / Regression analysis
- Meta-analysis

All the research methodologies have similarities and differences, but it is important to choose the right methodology for your research. Below there is a comparison between the research methodologies:

- **Qualitative research methodology** is descriptive. It analyses words by using specific research tools like interviews, surveys and observations. This research methodology is used to gain an understanding of underlying reasons, opinions, and motivations (Silverman, 2016).
- **Quantitative research methodology** is more statistically oriented and uses quantifiable data involving numerical and statistical explanations. It describes, infers, and resolves problems using numerical data. This research methodology is used to quantify the problem by way of generating numerical data (Choy).
- **Correlation / Regression analysis** is used to determine the strength of the relationship between two or more variables (Tonidandel & LeBreton, 2011).
- **Meta-analysis** is used when there is a need of identifying specific patterns or several points of relationships between multiple studies (L.Schmidt & Hunter, 2014).

Research Population

The research population used for this study is 11th-grade students of Mehmet Akif College - Lipjan. There are 3 different classes with around 20 students each: 11B, 11C and 11D. According to my experience, each class has approximately the same level of ICT knowledge. 11B is assigned as a control group, whereas 11C and 11D is the experimental

group. As anticipated at the beginning of the research there were no noticeable improvements of the students belonging to the control group whereas new methods, that comprise mainly of using gamification in lessons, applied to the experimental groups, have contributed to the improvement of ICT lesson efficiency of the students thus approving the hypotheses of this thesis. There has been a total of 59 students that participated in this research. Out of them, 19 belong to the control group whereas the rest – 40 students – are the students of two classrooms that are used as experimental groups. Part of the research has also been teachers.

Research Methodology

This research paper was conducted using a combination of different methods. Firstly, it must be stated that both qualitative and quantitative methods were used with the researcher conducting interviews with the ICT teachers of Mehmet Akif Colleges and International School of Prishtina. The aim of these interviews was to determine what kinds of gamification are used in their lessons and what its effect is. Then, students were asked to take a test with the purpose of evaluating their ICT skills. Afterward, the students of the experimental groups were observed after applying gamification methods in their lessons. All groups learned the same topics, from the same sources. While teaching the topics, the same materials (Presentations, Videos, etc) were used for all classes. The difference is that in the experimental group after every topic, students played Hot Seat Game and Schoology badges were awarded to the students according to their lesson performances.

Hot Seat Game will help the students recall, remember and understand better the concepts and terms that we have learnt in the lessons. And awarding badges to the students will increase their concentration.

The performance of the students in the Hot Seat Game will help me to understand how much the topics are covered by the students. Then, if lecturing is necessary, some concepts or topics can be repeated in the class. During the activities, areas of weaknesses in student comprehension can be identified, and the unclear parts of the lectures could be explained or discussed with the students. These activities will provide with clues for improving the quality of teacher-student interactions on meaningful student learning.

Additionally, a questionnaire was done to the experimental group in order to take the feedback of the students. This study is quasi-experimental as there is a group of the participants previously according to their classes as one control and two experimental groups.

After four months of using gamification with experimental groups, students were asked to take a similar test to the one they had taken prior to the beginning of the research. The aim of this test was to assess their improvements due to the use of gamification in the lessons. The tests used have targeted different skills of the students thus providing us with data regarding their level of ICT prior to the beginning of the research and after it was conducted.

Results and Discussions

Questionnaire

In order to capture the learners' feedback and assess the impact of the research study used and devised a questionnaire. There were 40 participants that filled in the questionnaire. The results are given below:

Question 1:

This question is made with the purpose to see the gender of the students. The survey was completed by 24 male students and 16 female students.

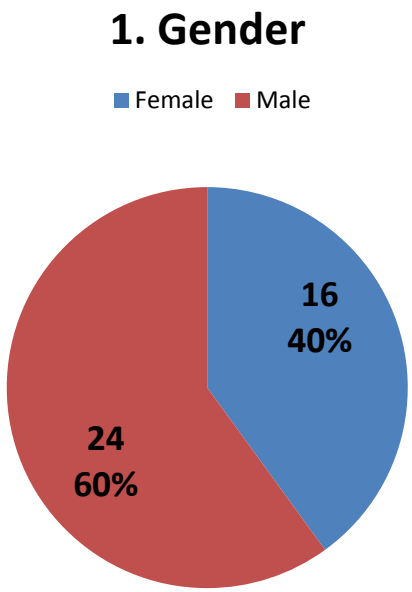

Figure 13 - Questionnaire Question 1

Question 2:

This question provides us with information about how the students evaluate the games used in the ICT lessons. In Figure 14 we can see that 25 of 40 students (62.5 %) evaluate the games used in ICT lesson as Very appealing, 13 students (32.5 %) say that the games were interesting; and 2 of them (5 %) think that they were boring. As it is seen in the graph, 95 % of the students have positive feedback about the games that were used in the ICT lessons.

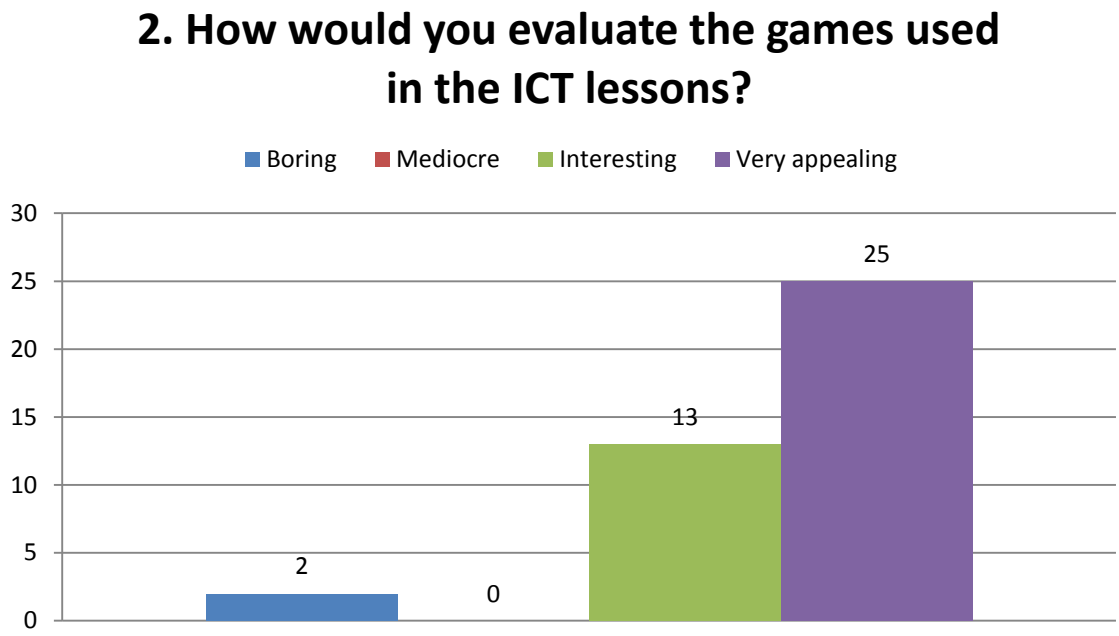

Figure 14 - Questionnaire Question 2

Question 3:

This question shows us “what is the best way of learning according to the students”. 21 of 40 students (53.5 %) more than half of the participants say that the best way of learning is when they play a game related to the topic they are dealing with. According to 13 students (32.5 %) discussing the topics with each other under the teacher's moderation is the best way of learning. 4 of them (10 %) think that the best way of learning is when the lesson is visualized in a presentation. And 2 students (5 %) prefer traditional learning as the teacher explains and they take notes.

From this graph, we can see that the participants of this research prefer student-based learning, as 85 % of the answers are when the students are in the main role of the lesson by playing a game or discussing the topic.

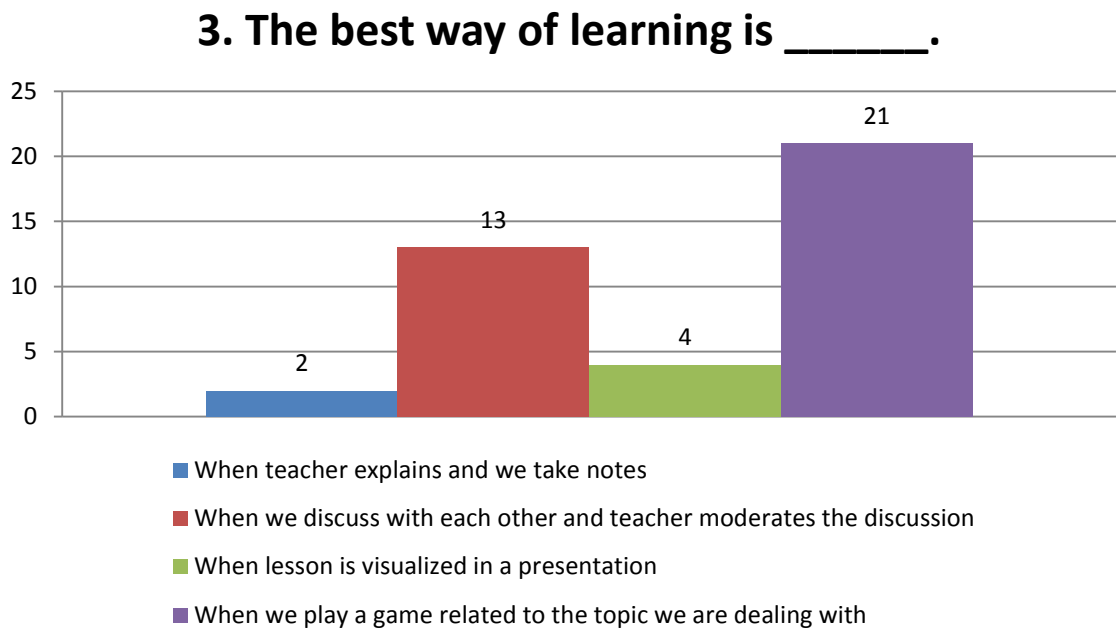

Figure 15 - Questionnaire Question 3

Question 4:

This question gives us information about the activeness and attention of the students in the lessons where the games are used. 92.5 % (37 of 40) students (21 students (52.5 %) strongly agree, 16 students (40 %) agree) have positive thoughts that using games in lessons is engaging. Whereas 5 % (2 students) are neutral, and 2.5 % (1 student) disagree that games make the lessons engaging.

If we compare the answers of this question, with the previous question, we will see that all the participants that have answered the previous question as "that the best way of learning is when they play a game related to the topic they are dealing with", they agree or strongly agree that using games in lessons is engaging.

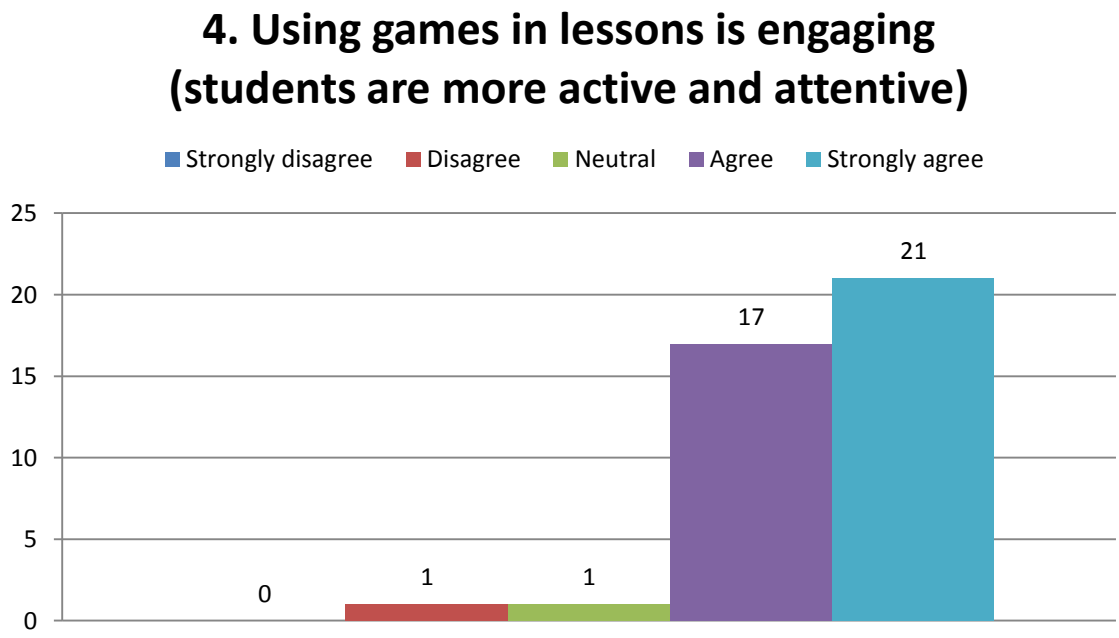

Figure 16 - Questionnaire Question 4

Question 5:

With this question, it's tried to get students' opinions if they think that gamification can make learning more rewarding. 19 of 40 students (47.5 %) strongly agree, and with the same number of students agree that gamification can make learning more rewarding. Totally we have 38 students and it is 95 %.

1 student is not sure if gamification can make learning more rewarding his/her answer is neutral, also another student disagrees with this sentence.

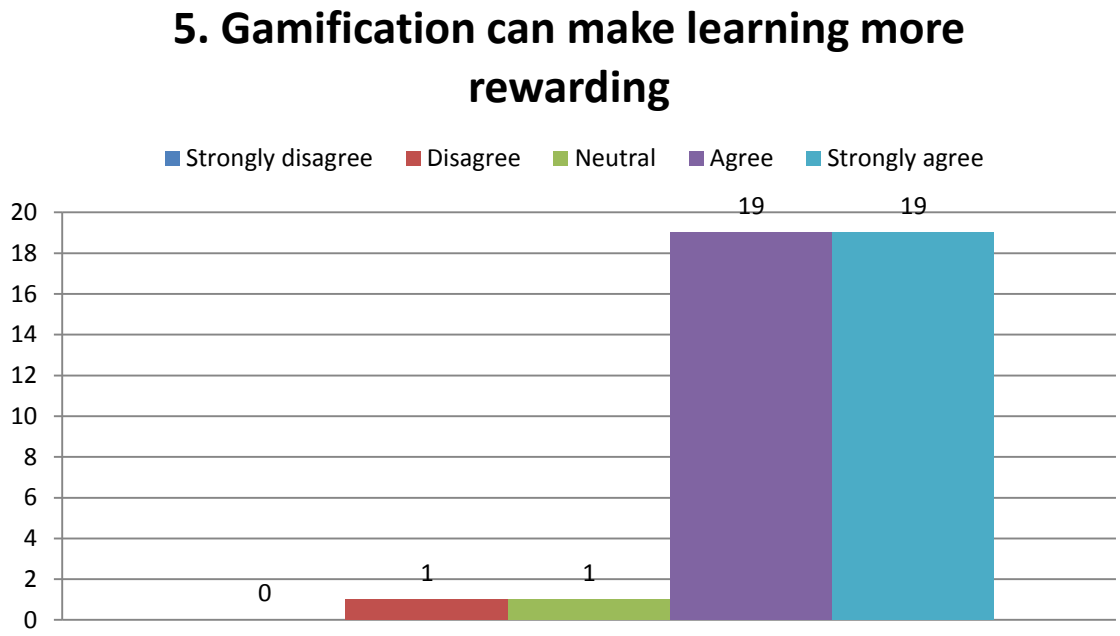

Figure 17 - Questionnaire Question 5

Question 6:

Question 5 asks if students think that gamification can help in learning, whereas question 6 asks if gamification helped them learn more. 17 of 40 students (42.5 %) strongly agreed that it helped them learn more, 18 students (45 %) agreed. 4 students (10 %) have a neutral answer, and 1 student (2.5 %) didn't get any help from gamification while learning.

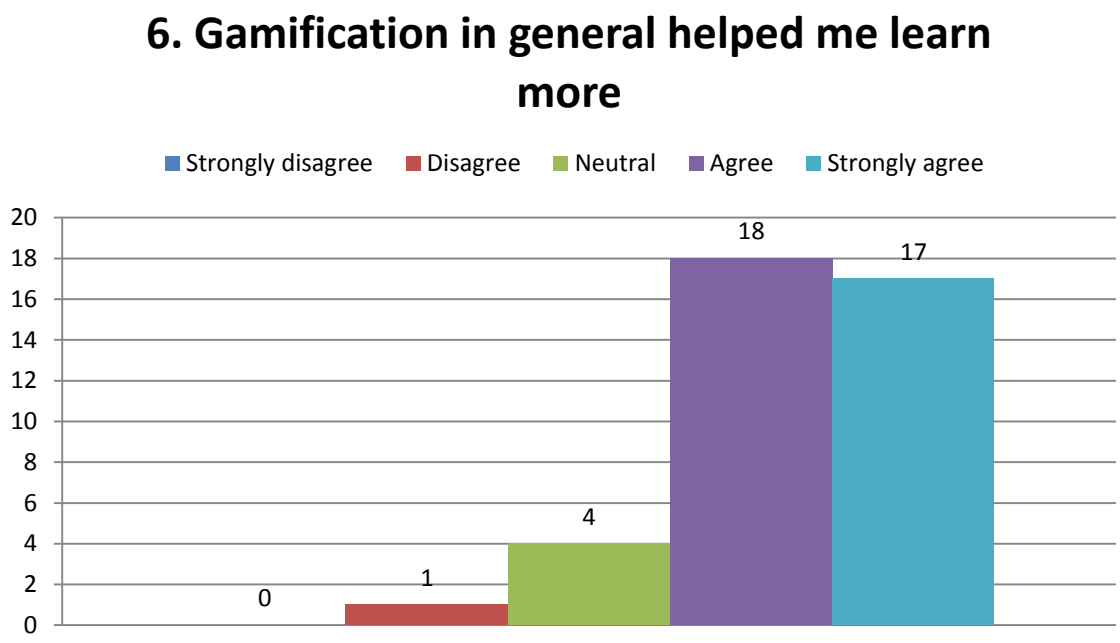

Figure 18 - Questionnaire Question 6

Question 7:

This question gives a view of the alternatives that suit the students the most regarding the classroom tasks. The alternatives given as choices are: I like to work individually, I like to work in pairs, and I like to work in groups. 50 % of participants (20 students) like to work in groups, 40 % of them (16 students) like to work in pairs, and 10 % (4 students) prefer working individually.

The students who like to work individually are all male. 2 of them in the second question evaluate the games used in ICT as boring, and according to 2 of them, the best way of learning is when the teacher explains, and they take notes.

From the 16 students that like to work in pairs, 50 % are male, 50 % female. And according to all of them, the best way of learning is student-centered learning (50 % "When we play a game related to the topic we are dealing with", 50 % "When we discuss with each other and teacher moderates the discussion")

The students who like to work in groups 12 of them are male, 8 females. 85 % of them evaluate the games used in the ICT lessons as very appealing. According to 65 % of them, the best way of learning is playing games related to the topics they are dealing with. And all of them have positive feedback that "Using games in lessons is engaging", "Gamification can make learning more rewarding" and "Gamification in general helps me learn more" questions.

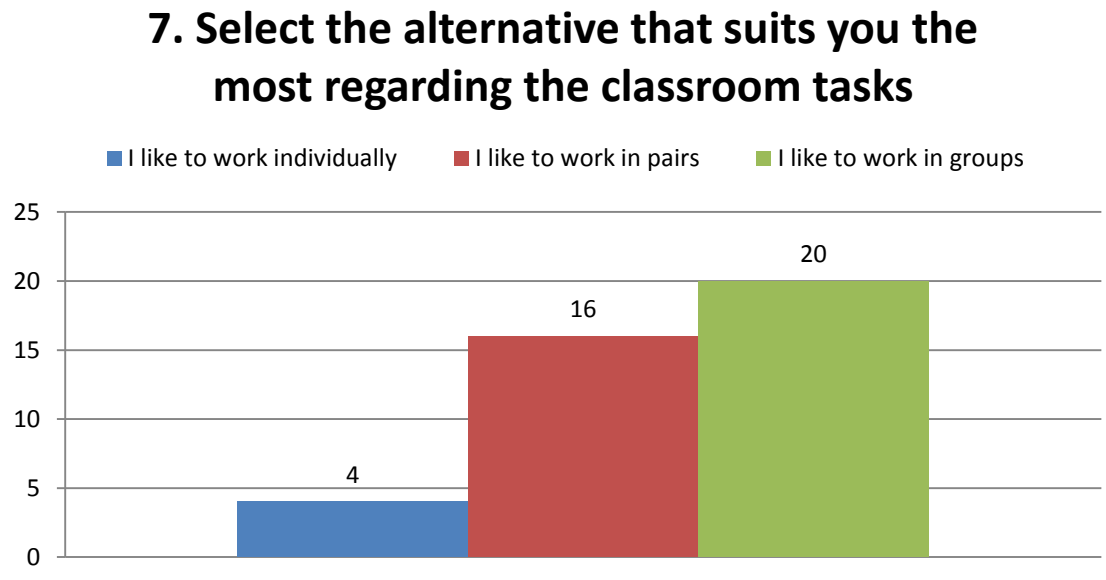

Figure 19 - Questionnaire Question 7

Question 8:

This question helps getting the students' feedback about the badges. Half of the students (20 of 40) agree that badges they collect systematically help them with their ICT grade; 7.5 % of them (3 students) strongly agree with this idea.

But on the other hand, a large group of students (16 students, 40 % of participants) is not sure if the badges help them with their final ICT grade. And one student (2.5 %) disagrees.

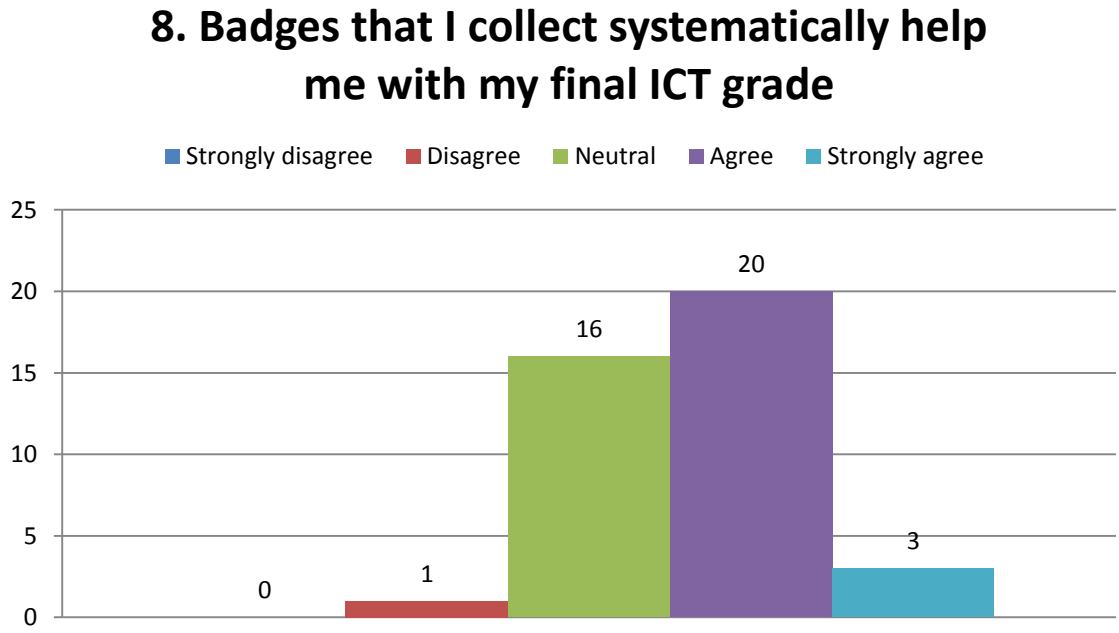

Figure 20 - Questionnaire Question 8

Question 9:

In this question, it's asked if the students are telling their parents about the badges, they getting the school. According to the results, none of the participants always tell his/her parents about the badges and medals they get. 5 students of 40 (12.5 %) usually inform their parents about this success. 15 students (37.5 %) "Sometimes", 11 students (27.5 %) "Rarely" tell their parents about the badges. And 9 students (22.5 %) never mention the badges at home.

8 of 9 students that never tell their parents about the badges are male. And 7 of them were neutral to the previous question (Badges that I collect systematically help me with my final ICT grade), whereas 1 student disagrees the effect of badges to his final ICT grade.

4 of 5 students that answered this question as "usually" agree or strongly agree that badges collected systematically help them with final ICT grade.

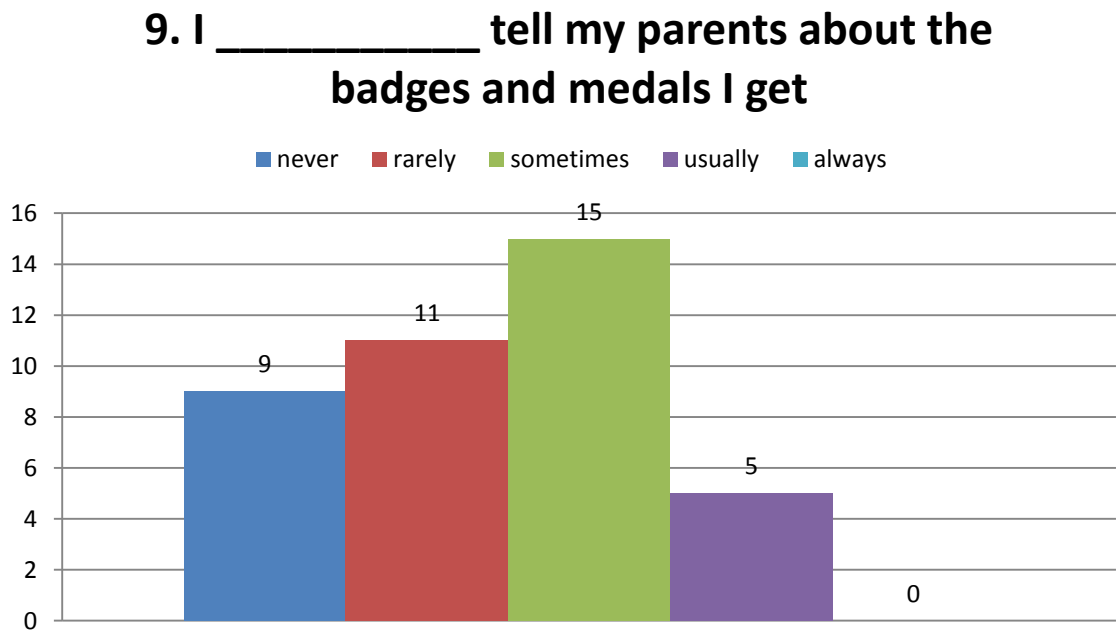

Figure 21 - Questionnaire Question 9

Question 10:

In this question, it's examined the competition among the students. 15 of 40 students (37.5 %) say that they compete with their friends about who gets a higher score in a game or who collects more badges. 11 students (27.5 %) chooses "sometimes" as the answer to this question, 5 students (12.5 %) answered as "rarely". 22.5 % of participants (9 students) never compete with their friends about the score of the games and the number of collected badges.

7 of 9 students who don't want to compete with their friends are boys. And 7 of them prefer either working in pairs or in groups as the alternative that suits them the most regarding the classroom tasks.

On the other hand, the students that usually compete with their friends in the lessons; also prefer working with groups or in pairs in the lessons. And 87 % of them think that badges help them with the final ICT grade. And all the students in "usually" group agree on the positive effect of gamification in ICT lessons (Questions 4, 5, 6).

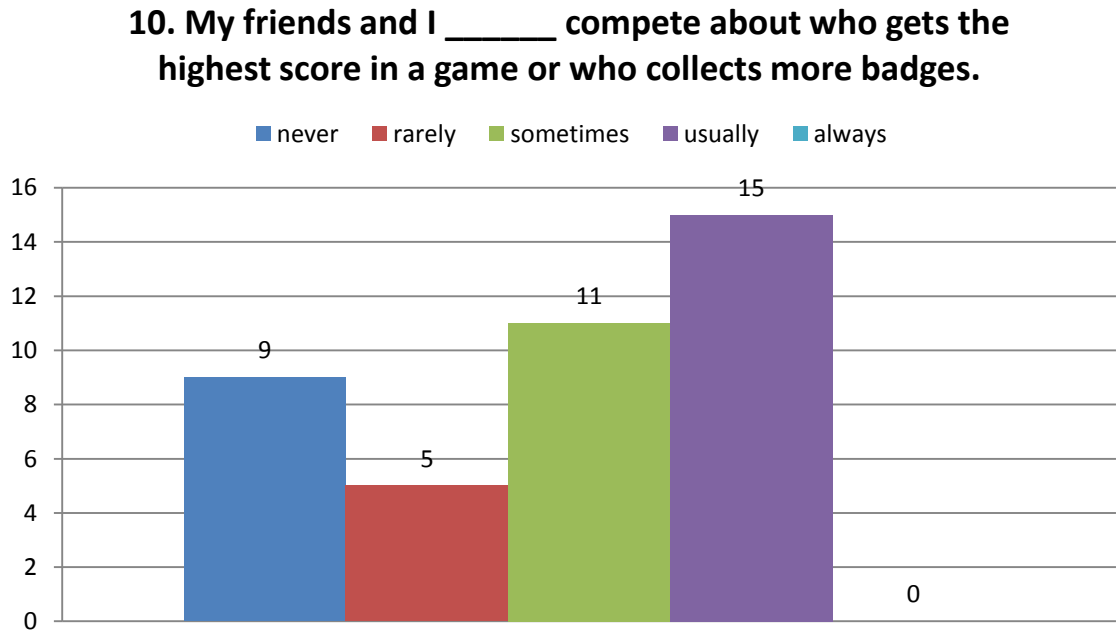

Figure 22 - Questionnaire Question 10

Question 11:

This question provides us with information about how being in competition effects the students. Only 1 of 40 students (2.5 %) strongly agree that being in a competition keeps his excitement alive. 60 % percent (24 students) agree that being in a competition keeps their excitements alive. 11 students (27.5 %) are neutral, 2 students (5 %) disagree and the other 2 strongly disagree with this idea.

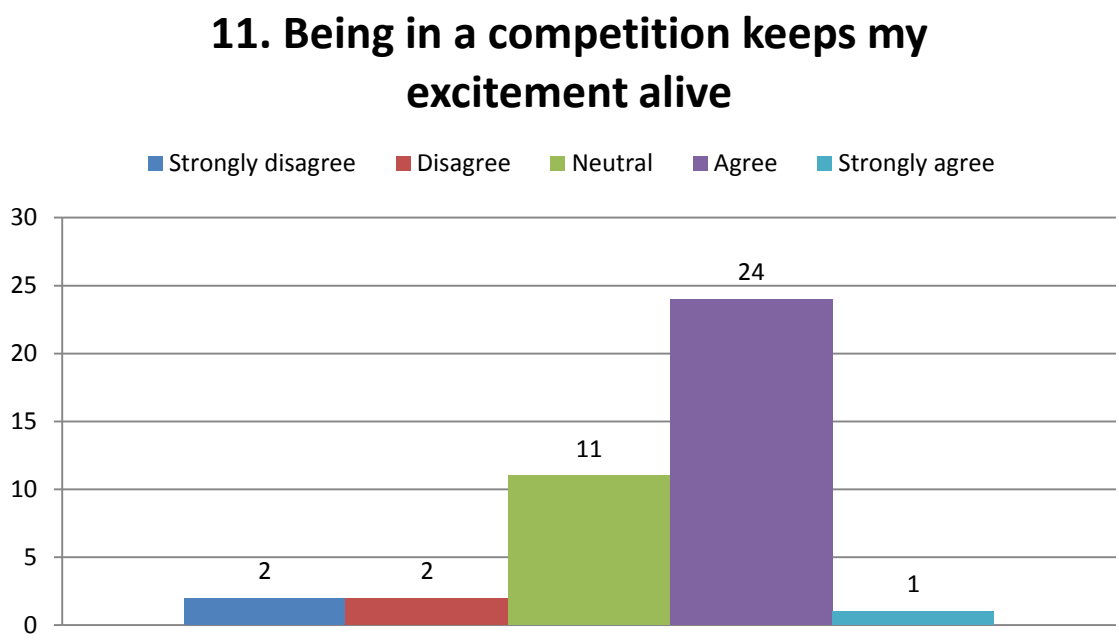

Figure 23 - Questionnaire Question 11

Interviews

The interviews where done with four ICT Teachers of Mehmet Akif Colleges and International School of Prishtina. The interviews consisted of 10 open ended questions. The answers are presented below.

Interview Question 1:

In which level are you teaching?

Answers:

Teacher 1: *9-12*

Teacher 2: *6-9*

Teacher 3: *9-12*

Teacher 4: *3-9*

Interview Question 2:

Do you use games while teaching?

Answers:

Teacher 1: *Yes*

Teacher 2: *Yes*

Teacher 3: *Yes*

Teacher 4: *Yes*

Interview Question 3:

What kind of games do you use in your lessons?

Answers:

Teacher 1: *Online games*

Teacher 2: *20Q, Hot seat game*

Teacher 3: *Games that involve the whole classroom (i.e. the broken phome, hangman, jeopardy quizzes (online quizzes related to certain topics), different vocabulary games involving cards)*

Teacher 4: *I use programming tutor games and sometimes educational games like abcya.com*

The purpose of this question is to see what kinds of games are being used in ICT lessons. As it is seen from the answers, ICT teachers are using the advantage of having ICT rooms and mostly use games that can be played with computers. Also, some "physical" games are played in the lessons.

Interview Question 4:

How did you expect that using game elements would affect the students' learning process?

Answers:

Teacher 1: *I expected that game elements will affect the students' learning process positively.*

Teacher 2: *I was expecting positive effective on learning motivation and efficiency.*

Teacher 3: *I believe games increase students' motivation towards learning.*

Teacher 4: *Yes, it's motivational and makes the students more active.*

These answers show the expectations of the teachers were optimistic before using games in the lessons. All teachers thought that the games would affect students positively.

Interview Question 5:

How did the students accept the game elements in the course?

Answers:

Teacher 1: *The students accepted the game elements in the course smoothly and gladly.*

Teacher 2: *They were more active and accepted it with greater interest.*

Teacher 3: *Students almost always tend to ask for more games. They are usually more attentive in hours we play games in.*

Teacher 4: *They like playing so no need to do something special.*

The aim of this question was to see the students' reaction to the use of games in the lesson. As it is stated in the answers of the teachers, students have accepted the game elements in the courses easily.

Interview Question 6:

What are the positive aspects of using gamification in lessons? Why?

Answers:

Teacher 1: *Students are more motivated in the lesson and learn better by practicing them in an interactive way.*

Teacher 2: *Educational computer games would motivate the students to learn ICT subjects and help them develop ICT knowledge and skills.*

Teacher 3: *Gamification is a more practical way for students to learn new things. I believe games also help students in visualization process of learning as they help students get more creative.*

Teacher 4: *It is motivating, makes the students active, goal based…*

The purpose of this question is to see the positive aspects of using gamification in the lessons. According to the teachers, gamification has increased the motivation of the students in the lessons. Also, some teachers think that also the ICT knowledge and skills of the students were developed.

Interview Question 7:

Do you think that gamification increases the interaction between students and teachers positively? Why?

Answers:

Teacher 1: *Yes, once I started using games in my lessons, I saw the positive evolving relationship between me and my students.*

Teacher 2: *Yes, I think students like the teachers who get out of traditional learning more.*

Teacher 3: *Yes, in my opinion gamification increases the interaction between students and teachers positively.*

Teacher 4: *Yes, the use of gamification affected the interaction between me and my studenst positively, in and outside of the lessons.*

The answers given to this question shows us that gamification has a positive effect on the interaction between students and teachers. The interesting part is that the teachers think that this interaction affects positively outside the lesson as well.

Interview Question 8:

Would you like to use gamification in your lessons in the future? Why?

Answers:

Teacher 1: *Since gamification increases the motivation of the students, I want to use it in my lessons in future.*

Teacher 2: *I would like to use gamification in the lessons. Since it increases motivation and makes student more active.*

Teacher 3: *Yes, I intend to continue using games for the abovementioned reasons.*

Teacher 4: *Yes, I like to use in future because I think it's good to use in education and beneficial. But some educational features should be added to the games like while somebody is playing a game about programming in same steps some good character-built messages can be put.*

The purpose of this question is to see the future plans of the teachers related to using gamification in the lessons. Since they think that gamification has positive effects to the students, all the teachers participated to this interview are planning to use gamification in the future as well.

Interview Question 9:

How frequently should gamification be used in lessons? Why?

Answers:

Teacher 1: *The frequency of using games in the lessons can be changes according to curriculum.*

Teacher 2: *We cannot say exactly how long last it should be. It is up to curriculum, subject, motivation and concentration of student.*

Teacher 3: *My opinion: once in 3-4 lessons*

Teacher 4: *Not too much. I think students are playing too much. As a computer teacher we have to consider the time of playing games. It should not be more than 1 hour in a day. And the games should be planned very well.*

This question finds out the opinion of the teachers about the frequency of using games in the lessons. As can be seen, teachers have different answers to this question. Some of the teachers say that the frequency should be arranged according to curriculum (the topics). They also think that we don't have to use the games very often.

Interview Question 10:

What are your suggestions for designing courses with game elements?

Answers:

Teacher 1: *Games should be coherent with curriculum, designed to cover every student, easily evaluated.*

Teacher 2: *Educational computer games must be aligned with the curriculum, free, compatible with school computers, fun, challenging, proven to be effective, and easy to use in order to be used in the ICT Labs.*

Teacher 3: *It is very important to include games in the annual plan. However, I believe that different games are suitable for different groups of students. Therefore, in many cases, a teacher is not able to plan a lot beforehand (more of an opinion rather than a suggestion :))*

Teacher 4: *Good planned; Educational materials; Not too long; Good evaluated; Enjoyable not boring; Well prepared targets to achieve*

The purpose of this question is to see the suggestions of the teachers for designing courses with game elements. The most important suggestion is to adapt the games with the curriculum.

Test results

After four months of using gamification with experimental groups, students were asked to take a similar test to the one they had taken prior to the beginning of the research. The aim of this test was to assess their improvements due to the use of gamification in the lessons. The tests used have targeted different skills of the students thus providing us with data regarding their level of ICT prior to the beginning of the research and after it was conducted.

Control Group		
Student	Result (Beginning)	Result (End)
Student 1	68	65
Student 2	83	88
Student 3	62	73
Student 4	95	91
Student 5	40	34
Student 6	80	76
Student 7	95	97
Student 8	40	41
Student 9	35	31
Student 10	80	77
Student 11	85	90
Student 12	66	80
Student 13	30	35
Student 14	55	50
Student 15	60	55
Student 16	40	37
Student 17	70	77
Student 18	30	34
Student 19	10	15
Average	*59*	*60*

Experimental Group		
Student	Result (Beginning)	Result (End)
Student 1	75	90
Student 2	75	80
Student 3	62	70
Student 4	92	90
Student 5	93	95
Student 6	77	80
Student 7	100	100
Student 8	64	65
Student 9	85	90
Student 10	65	65
Student 11	42	40
Student 12	92	95
Student 13	95	100
Student 14	30	45
Student 15	77	85
Student 16	92	95
Student 17	88	95
Student 18	50	65
Student 19	20	40
Student 20	85	95
Student 21	97	95
Student 22	90	100
Student 23	35	55
Student 24	70	80
Student 25	62	65
Student 26	95	96
Student 27	90	95
Student 28	50	60
Student 29	38	44
Student 30	70	78
Student 31	85	88
Student 32	90	90
Student 33	88	90
Student 34	72	74
Student 35	35	45
Student 36	95	95
Student 37	95	90
Student 38	80	85
Student 39	55	65
Student 40	82	90
Average	*73*	*79*

As mentioned above, in the research we have a control and an experimental group. According to the exam results shown in the table above, the average of control group in the test that was done before the research started is 59, and the average of the same group at the end of the semester is 60. The difference on average of the control group, that traditional methods were applied during the learning process, is % 1.

On the other hand, the difference between first and last exams of experimental group is %6. Where we can see explaining the topics using gamification has positive effects on the success of the students.

Conclusion

This research paper has been conducted with the aim of the impact of usage of Gamification in ICT lessons. After four months of implementing of gamification to ICT lessons and having compared the data derived from the tests conducted with students of these classrooms with the students of a control group, who have followed regular curriculum, we have concluded that gamification plays a major role in acquiring different skills. During this period students have shown a greater interest towards the lesson compared to the times when no game elements have been applied in classroom and this enthusiasm has resulted in great achievements. Furthermore, thanks to questionnaire and interview conducted with the students and teachers of ICT it was concluded that gamification has a positive impact on students.

Prior to starting this research several research questions were prepared and they have served as the backbone of this study. Below these questions were elaborated individually with the aim of providing a better understanding regarding the issues we have raised and tried to solve on this paper.

- **Does gamification have an impact on students' motivation?**

It was concluded that gamification has a great impact on students' motivation, making them pay more attention to the lesson and most importantly, better understand the lecture that teachers try to convey. According to several studies around the world, the use of gamification in the lessons has a positive impact on students' motivation. Students who have been part of this survey have experienced an increase in their efficiency after participating in classes that used game elements. Teachers, who have been part of this research, have also stated that whenever gamification have been used in their class students have been more enthusiastic about their subject thus, they have been more motivated to learn ICT.

- **How should gamification be used appropriately in ICT lessons?**

According to the feedback of the teachers, in order to use gamification in an appropriate way the games should be coherent with the curriculum, well planned, designed to cover every student.

- **Gamification can increase student engagement and participation in lessons & Gamification can increase teachers' motivation in lessons**

As it can be seen in the results and literature review sections of this paper, gamification plays an important role in increasing students' motivation in classroom. This means that these hypotheses have been proven to be right.

- **Gamification can increase the interaction between students and teachers positively**

Another hypothesis that has turned out to be right is the fact that when a teacher uses game elements in a lesson, the relationship between the teacher and students develops positively in and out of the lesson.

Future work

Knowing that no matter how wide the research is in a certain topic it is impossible to cover everything related to that specific issue we are fully aware that this research paper has a lot of limitations. Firstly, the number of research population is way too small thus no generalizations can be made regarding the student numbers of Mehmet Akif Schools, let alone the students and teachers in schools of Kosovo.

Also, the game elements that we used in this research were limited. If various games and game combinations are used healthier results will be achieved.

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Appendices

Badges in Schoology

In schoology, badges are placed on the left menu of your course profile. You can select badges from the list of Schoology badges to help you get started. If you haven't added all of the badges at once, you may access Schoology badges at a later time from the Add Badges button near the top of the Badges page.

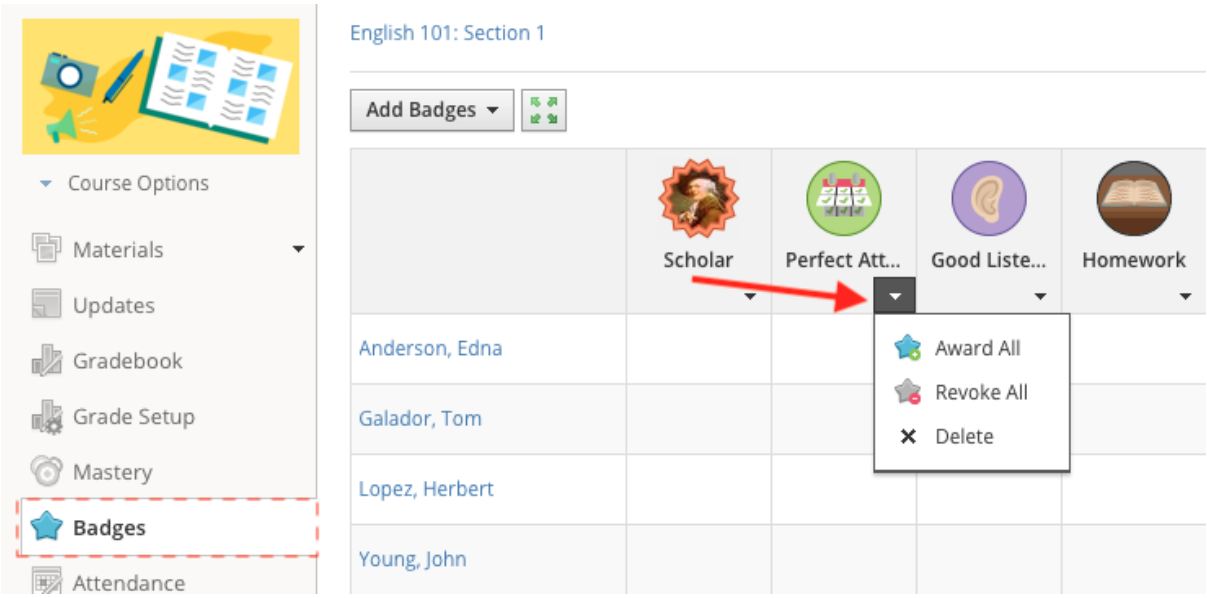

Figure 24 - Badges in Schoology

To award badges to students of the course, these steps can be followed:

- You can award a badge to a particular student by clicking on the cell of the student to whom you'd like to award a particular badge. A check mark indicates that the student has been awarded the badge.
- You can award a badge to all members of the course by clicking on the dropdown menu in the header for each badge.
- You can revoke a badge from all members of the course by clicking on the dropdown menu in the header of each badge.
- You can delete a badge from your course by clicking on the dropdown menu in the header of each badge.

Creating your own badges

Creating your own badges enables you to engage students of your course in creative ways, and add motivation for accomplishing specific results in your course.

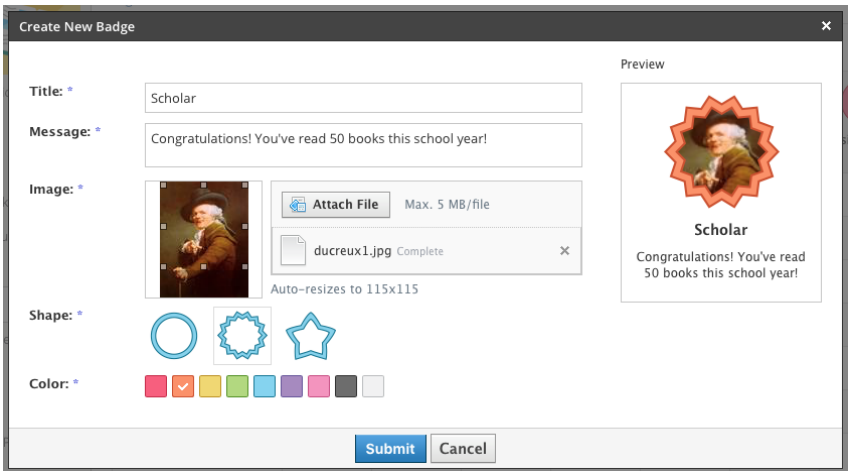

Figure 25 - Creating your own badges

To create a badge, these steps can be followed:

- Click on the Add Badges button near the top of the Badges area.
- Select the option to Create New Badge.
- Add a title, a descriptive message, and an image for the badge.
- Select a shape with which to frame the image.
- Select a color for the frame.
- Click Submit to complete.

Your new badge will appear in the front of the Badges table.

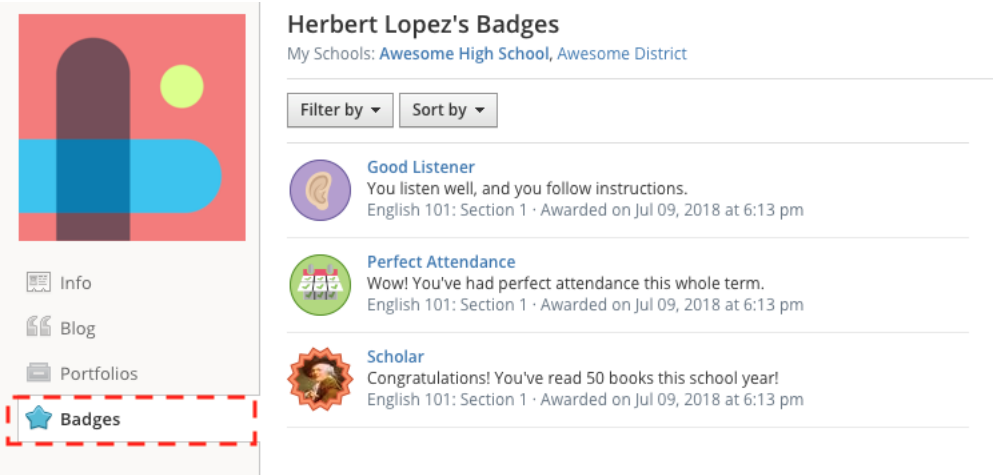

Figure 26 - Badges

Curriculum of 11th grade

- Introduction, History of the Internet
- Internet servers
- Popular uses of the Internet
- Internet tools
- Internet programs
- Physical connections
- Internet service provider
- Internet software
- Internet connection types, Accessing the internet
- Accessing the www, Sharing the internet
- Web browsers

Questionnaire

Greetings! Thank you for taking the time to complete this questionnaire. Your feedback is very important in understanding whether gamification (different games and reward-oriented approach) helps in increasing students' motivation thus their overall performance in ICT lessons. The answers are supposed to be based on your learning experience as well as your general opinion regarding the effect of gamification in ICT lesson. **This questionnaire is totally anonymous, so you are encouraged to answer as honestly as possible.**

Below you may find the definition of gamification:

Gamification describes people's engagement in non-game contexts using game mechanics. Gamification leverages people's natural tendencies for competition, achievement, collaboration and charity. Tools employed in game design such as rewarding users for achievements, "leveling-up", and earning badges are carried into the real world to help motivate individuals to achieve their goals or boost performance.

1. **Gender**
2. **How would you evaluate the games used in the ICT lessons?**

- Boring
- Mediocre
- Interesting
- Very appealing

3. **The best way of learning is _____.**

- When teacher explains and we take notes
- When we discuss with each other and teacher moderates the discussion
- When lesson is visualized in a presentation
- When we play a game related to the topic we are dealing with

4. **Using games in lessons is engaging (students are more active and attentive)**

- Strongly disagree
- Disagree
- Neutral
- Agree

- Strongly agree

5. Gamification can make learning more rewarding.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

6. Gamification in general helps me learn more.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

7. Select the alternative that suits you the most regarding the classroom tasks.

- I like to work individually
- I like to work in pairs
- I like to work in groups

8. Badges that I collect systematically help me with my final ICT grade.

- Strongly disagree
- Disagree
- Agree
- Strongly agree

9. I _____ tell my parents about the badges and medals I get.

- never
- rarely
- sometimes
- usually
- always

10. My friends and I _____ compete about who gets the highest score in a game or who collects more badges.

- never
- rarely

- sometimes
- usually
- always

11. Being in a competition keeps my excitement alive.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Thank you!

Teacher Interview

1) In which level are you teaching?
2) Do you use games while teaching?
3) What kind of games do you use in your lessons?
4) How did you expect that using game elements would affect the students' learning process?
5) How did the students accept the game elements in the course?
6) What are the positive aspects of using gamification in lessons? Why?
7) Would you like to use gamification in your lessons in the future? Why?
8) How frequently should gamification be used in lessons? Why?
9) What are your suggestions for designing courses with game elements?