Promoting High School ESL Learners' Motivation and Engagement Through the Use of Gamified Instructional Design

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ABSTRACT

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Mourad Majdoub

Judging from what has been said about the lack of motivation or interest and the poor academic performance of ESL students, the need for new effective and efficient teaching methods has become a priority. This research study seeks to explore the impact of implementing a gamified instructional design on ESL students' motivation and engagement. A convenience sample of 8 grade 10 ESL high school students participated in the study. An online gamified program called *Classcraft* was selected as the main study platform for its potential to allow the participants to experience gamification elements such as rewards, challenges, points and the sharing of their progress online. A mixed methods approach was used where quantitative and qualitative data were collected, analyzed separately and then merged in discussion and interpretation. The quantitative component of this study consisted of survey questionnaires administered before and after the gamified intervention. The qualitative component, which employed a constructivist grounded theory approach, included a focus group interview and field observations. Results showed that gamification elements design has a very positive impact on the participants leading to a potential increase of their motivation and engagement.

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Chapter 1 - Background

The current market for video games, be it home consoles or smartphones and tablets, has recently known a dramatic grow. With these and many other innovations in information and communication technologies, young people's communication, recreational interests and learning attitudes in the last twenty years have shifted radically. According to Prensky (2012), this shift has helped in the emergence of what is called: "Games Generation" that he defines as "native speakers of the digital language of computers, video games and the Internet. Those of us who were not born into this world but have, at some later point in our lives, become fascinated by and adopted many or most aspects of the new technology are, and will always be, compared to them, "Digital Immigrants" (Prensky, 2001).

This brings us to the question of how the Games Generation is different from the other generations. Zur Institute in one of its reports entitled "*Psychology of the Web and Internet Addiction*" claimed that young people, unlike older generations, are highly capable of efficient multitasking, which may seem to the older generations as lack of attention and lack of focus (Walker & Zur, 2014). The Games Generation's minds have been programmed to adapt to greater speed. Yet when they go to school or to work, educators and trainers typically give them all the "nontwitch" features of the past: "tell-test" education, boring corporate classrooms, poor speakers lecturing at them, talking-head corporate videos, and, lately, endless "click and fall asleep" courses on the Internet (Prensky, 2001). What these young people learn and how much they learn are both influenced by

their level of motivation. According to the American Psychological Association, learner's positive emotions such as curiosity can increase motivation and facilitate learning; however, negative emotions and related thoughts such as anxiety, worrying about competence, or failure can decrease motivation and interfere with learning. Another way to foster motivation is to provide learners with the opportunity to interact and collaborate with others. In this context, several researchers advocated the use of games in teaching (Game-Based Learning Approach), suggesting that its use would provide opportunities for students to become actively involved in problem solving (Garris, Ahlers & Driskell, 2002). It positively effects the self-regulation of students' learning process (Rosas, Nussbaum, Cunsille, Marianov, Correa, Flores & Salinas, 2003). It also fosters students' enjoyment and effort and ultimately fosters their motivation and learning (Cordova, 1993). However, this approach presents several challenges. To produce educational video games with the quality of commercial video games requires large budgets (Johnson, Smith, Willis, Levine & Haywood 2011), which represents a major barrier to its adoption in schools. Furthermore, using them in classrooms requires special training and certain expertise from the part of the teacher, which is costly and time-consuming for most subjects.

To bridge the gap, one of the most noteworthy trends in this context is the concept of gamification, which attempts to augment the traditional classroom experience by infusing it with game-like elements (de Freitas & de Freitas, 2013). In a typical gamified classroom, students earn points, get badges and increase their level upon completion of classroom assignments, tasks or challenges. With this being said, teachers can use gamification to craft an experience that is both

compelling and educational by closely aligning the game's tasks and rewards with learning objectives (Jensen, 2012).

Several studies have been conducted on the utility of gamification in various domains as a means to motivate people and affect change in different aspects of their lives. Movipill (de Oliveira, 2010), for instance, used gamification features, namely points and a leaderboard, with a pillbox increased with sensors to encourage patients to take their medication on time. Foursquare (Zachary, Tjondronegoro & Wyeth, 2011) is another gamified service that utilised sensors on smartphones to capture user contexts as a means of triggering game elements. In education, there have been several implementations of gamification in the classroom, and each experimentation has yielded positive results (Bertoli, 2012; Ross, 2010). However, most of these experimentations used a manual approach, which can be time consuming for teachers. Furthermore, research on gamification has mainly been interested in high education in general.

Statement of the Problem

Although the literature suggests that the use of gamification increases user engagement, studies are scarce about its use in high school and even inexistent in ESL learning context where several hindrances exist such as anxiety, academic low achievement and traditional teaching methodologies. With this in mind, the present study attempts to implement and evaluate a gamified instructional design in motivating and engaging high school ESL students.

Research Questions

In an attempt to address the purpose of this study, two main research questions were asked:

1. What impact does using gamified learning materials have on students' motivation and engagement?

2. What gamification elements would motivate and engage ESL learners?

Chapter 2 - Literature Review

Game Play and Learning Opportunities

Recently, the speed and evolutions of computer games, together with the convenience and comfort they provide have been considered as a potential motivational learning tool in the educational field.

Games and the Sense of Autonomy

With this being said, games provide learners with some curricular choice and certain control over their learning. Game features support learning in the sense that kids are free to discover and adapt learning and teaching styles that suit them, which in turn allow players to take on active roles in determining how, when, and why they learn (Klopfer, Osterweil & Salen, 2009). In this context, Cheng (2009) suggested that traditional lecture based instruction is not only ineffective for learners in achieving the expected learning outcomes, but it restricts students from having autonomy to create and present their own products as well. He surveyed 25 higher diploma students majoring in Information Technology on the effectiveness of a pedagogical model named "*Game Making Pedagogy"* (GMP) in fostering their learning motivation, problem solving ability and creativity. He noted that 56% of the students mentioned that they had a strong sense of autonomy and ownership over their project outputs. In fact, one of the participants stated that the game provided great flexibility for him to design and implement his own ideas into a multimedia game and that the sense of autonomy and ownership pushed him to spend more time on the game project (Cheng, 2009).

In a related study, Ketelhut, Dede, Clarke and Nelson (2006) emphasized the importance of games in enabling learners to explore their learning environments independently. The purpose of their research was to assess the contribution of a problem-based inquiry science experience to the enrichment of learners' inquiry skills and content coverage. 2000 students considered to be disengaged from schooling or difficult to motivate participated in a virtual game project called "*River City*". During the experiment, participants came up with their own hypotheses and experiments to solve the problem. Ketelhut and her team reached the conclusion that the use of science inquiry games allowed the learners to build 21st century communication skills and to enhance their learning (Ketelhut, Dede, Clarke & Nelson, 2006).

Although games provide learners with a certain autonomy and control over their learning, teachers' instructional support is crucial in transferring what has been learned through games into other meaningful contexts (Ke, 2009) as computer games can replace certain learning activities, textbooks and laboratories but never teachers (Steinkueler & Chmiel, 2006).

Games and Feedback

Feedback is an extremely important factor when it comes to learning and achievement. According to Schaffer (2006), games enhance understanding, motivation, as well as enjoyment, and are wonderful at immersing players in feedback-rich, complex problem spaces (Schaffer, 2006). Stråat, Johansson and Warpefelt (2013) supported the same claim when they suggested that what makes games distinguished from the other teaching tools is its ability to provide feedback in an immediate, consistent, exciting and challenging way. Such

feedback has been shown to have a positive influence on players' learning outcome (Stråat, Johansson & Warpefelt, 2013).

Cameron and Dwyer (2005) similarly argued that gaming feedback functions as an advance organizer by providing learning guidance, and suggesting meaningful organization of the target content. Cameron and Dwyer's study examined the effect of gaming feedback on delayed retention of several types of educational objectives for 422 students. According to Cameron and Dwyer (2005), games with feedback provided the level of rehearsal necessary for the synthesis of information to move into long-term memory for delayed retention. Moreover, feedback presence was crucial in facilitating increased student achievement. However, only sustained elaborative feedback was efficient in facilitating delayed retention than knowledge of response feedback (Cameron & Dwyer, 2005).

On the other hand, Dickey's (2005) research into several design aspects of video games revealed that not all games are beneficial when it comes to providing clear and constructive feedback. Even though today's games have evolved to incorporate advanced features such as: HD graphics, special effects, role playing and representations of 3D spaces, Dickey (2005) suggested that because of the various range of possible environments and activities, it is not always easy to generate functional guidelines to integrate efficient learning feedback into game design. The best way according to her is to combine game design with efficient instructional design for the gaming feedback to be constructive (Dickey, 2005).

Games and GameFlow

Csikszentmihalyi's *Flow Theory* (1990) is derived from the idea that when players are immersed and are enjoying the game, they feel as though they are carried along by water current. Technically speaking, this state of mind is a psychological state that is achieved when humans are enjoying a gaming or a learning experience and are completely immersed in the task at hand to the point that they lose awareness of everything else (Csikszentmihalyi, 1990). According to Csikszentmihalyi (1990), to reach the state of "flow", certain conditions (Figure 1) are necessary:

Figure 1. **Csikszentmihalyi Flow theory criteria**

Flow or *GameFlow,* as Sweetser and Wyeth (2005) call it, has the potential of identifying the common aspects existing between enjoying computer or video games and enjoying other learning activities in order to create optimal experiences. In other words, Flow theory can help understand in what way players can further relate experiences of enjoyment and pleasure to similar experiences occurring in other activities (Jegers, 2009).

However, the original version of Flow theory is not enough to determine the aspects and mechanisms of game design that are essential for players' optimal experiences. Sweetser & Wyeth (2005) complemented Csikszentmihalyi's Flow theory with specific mappings of existing heuristics (game evaluation, usability and playability) to define a model for evaluating players' enjoyment. This modal has 8 criteria shown in Figure 2.

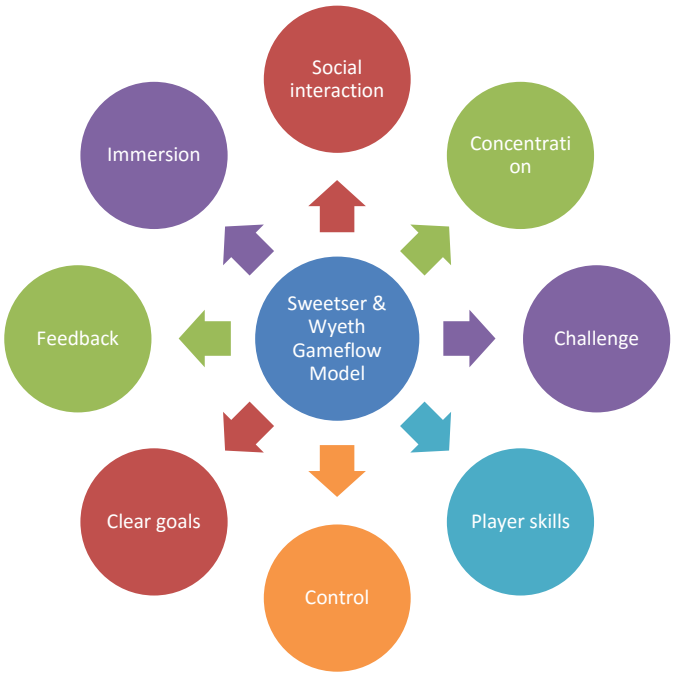


Figure 2. **Sweetser & Wyeth GameFlow criteria**

In a related research, Chen (2007) suggested that any game design should include a four-step methodology to provide an enjoyable and pleasant experience for players. These steps are:

- ✓ Mix and match the components of Flow;
- ✓ Keep the user's experience within the user's Flow Zone;
- ✓ Offer adaptive choices, allowing different users to enjoy the Flow in their own way;
- ✓ Embed choices inside the core activities to ensure the Flow is never interrupted.

With this being said, to maintain the player's interactive experiences and enjoyment, game designers have to keep the user in the Flow Zone. To do this, Chen (2007) emphasizes the need to balance the inherent challenge of the activity with the user's ability to overcome it (Chen, 2007).

Games and Cognitive Skills Development

According to Prensky (2012), games are an excellent instrument for developing problem-solving skills. Game design usually provides little instruction on how to solve problems, leaving players with the opportunity to think systemically, and therefore, explore a huge range of possible solutions using present knowledge, past experiences and intuitions. The same researcher argues that instead of acquiring knowledge through explicit linear instruction such as reading, players solve problems through trial and error, collecting evidence that they test through experimentation (Prensky, 2012). One of the studies that explored the impact of games on players' problem solving skills is Adachi and

Willoughby (2013). The results showed that playing strategic video games improves adolescents' self-reported problem-solving skills. Moreover, the same results reported that strategic game play predicted higher self-reported problem solving skills, and, in turn, higher self-reported problem solving skills predicted higher academic grades (Adachi & Willoughby, 2013). However, more research is needed to examine the real capacity of video games to teach problem-solving skills and whether these skills can be generalized to real world contexts.

Additionally, games seem to be associated with anther cognitive benefit: enhanced attention. Green and Bavelier (2012) conducted a study where gamers were recruited to play *Shooter* video game and another video game during the same period of time. The players have hardly or never played the target games before. Compared to the control group (the other video game), the experiment group (*Shooter* video game) showed higher spatial resolution in visual processing, enhanced mental rotation abilities and faster and more accurate attention allocation (Green & Bavelier, 2012). These cognitive skills have been proven to enhance neural processing and efficiency. A recently published FMRI (Functional Magnetic Resonance Imaging) study suggested that *Shooter* gamers allocate their attentional resources and filter out irrelevant information more efficiently because they found that the attention allocation control mechanisms were more active in gamers than in non-gamers during a challenging task.

Games as a Motivating and Engaging Force

Another positive aspect of game-based education is engagement. In this context, Dickey (2005) argued that game design features keep students engaged through the different tasks they may work through, mainly player positioning,

narrative and interaction. In the same trend, a research conducted by Shute, Ventura, Bauer and Zapata-Rivera (2009), highlights the importance of certain game components in increasing engagement and enhancing academic achievements. These components are clarity of goals, feedback, balance between ability level and challenge and sense of control.

When contrasting traditional teaching methods based on rigid rules with new technology-based methods, motivation emerges as a key benefit. The study of (Groff, Howells & Cranmer, 2010) surveyed a sample of students playing console games, school leaders and teachers from more than 19 schools in Scotland. The interesting fact about this study is that motivation was clearly the driving force behind students' positive achievement. The study stressed that for teachers to motivate students, they should use games as a hook or stimulus to build learning activities around students' interests since the majority of children bring their existing skills, interests and knowledge into the classroom. In the same context, several other studies conducted by Tuzun, Yilmaz, Karakus, Inal and Kizilkaya (2009) and Kebritchi, Hirumi and Bai (2010) were able to demonstrate that the implementation of computer games for learning in geography (Tuzun, Yilmaz-Soylu, Karakus, Inal & Kizilkaya, 2009) and in mathematics (Kebritchi, Hirumi & Bai, 2010) was an effective motivational tool to enhance students' learning through combining learning and fun.

Furthermore, a clear disagreement is still present in what makes a game motivating. While Dickey (2005) mentioned clear goal, feedback and challenge as the main elements of engagement, Fladen and Blashki (2005) stated the motivational features of a game to be interactivity, agency and engagement.

Rigby and Ryan (2007), on the other hand, argued that competence, autonomy and relatedness are the key elements of a motivational game.

Challenges of Game-based Learning

Design

Game design may lose its funny aspects when focusing on educational results instead of the action itself. In fact, when games are used in an educational context, the rules are altered to fit the academic purposes, certain game restrictions may apply for its age or context inappropriateness and players are deprived from the chance to play games in their own styles. Therefore, the desired learning outcomes may dramatically change (Jan, 2013).

The same claim has been reported by Egenfeldt-Nielsen (2005) when he argued that the lack of connection between learning and gameplay often limits the effect of the game as a learning reward. He used the example of "*Math Blaster*", a serious game in which players shoot down the balloon that contains the right answer, to demonstrate how the game (constant shooting of balloons) can result in a conditioned response regardless of the learning context or objective (mathematics) (Egenfeldt-Nielsen, 2005).

Another challenge may rise when the aim of a game doesn't line up with the aim of the lesson. Usually, teachers find it hard to strike a balance between making games fun and meaningful at the same time. Some of the tasks they may face are: examining the educational content or learning goals of the game, debriefing the game, discussing the game outcomes with students and evaluating

knowledge transferred from games. As a result, both leaning goals and fun aspects are undermined.

Assessment

Field literature has identified several assessment challenges facing educational games. First, because games don't often rely on memorization of facts, traditional methods might not be appropriate to assess the learning gained (Chen & Michael, 2005). Moreover, both Iuppa and Borst (2007) and Chen and Michael (2005) identified a number of evaluation issues that may arose with playing serious games: measuring abstract skills such as teamwork and leadership, accommodating the wide range of possible solutions in a game, assessing different levels of knowledge transfer and determining the definition of "cheating" in the context of gameplay. To meet these issues, serious games developers recommended the use of completion assessment because it is simple, straightforward and easy to use. However, this type of assessment has proven inefficient in distinguishing between the ability of the player in learning the material in the game and his or her ability in beating the game.

Other Challenges

Game-based learning can be costly. Purchasing either game software or annual game subscriptions for a school requires a big budget. Furthermore, certain games need consoles and the educational context requires classrooms to be equipped with a variety of game choices, which are considered extra fees to figure out. With this being said, school budgets are often unable to meet the financial needs of integrating games into the classroom.

Video games have received a lot of criticism. First, several studies have addressed the negative impact of playing violent games on kids' behaviour. In addition, constant gameplay may lead to the emergence of addiction-like symptoms, which in turn might result in eating disorders, restless or irritable mood, low academic performance and less commitment to spend time with family and friends.

Gamification Vs. Game-based Learning

Several researchers have tried to give a full-fledged definition to the newly emerged concept of gamification. Lee and Hammer (2011) define it as "the use of game mechanics, dynamics and frameworks to promote desired behaviors" (Lee & Hammer, 2011). Swan (2012), on the other hand, refers to gamification as the process of adding game mechanics to processes, programs and platforms that wouldn't traditionally use such concepts. However, Goehle (2013) added other aspects when he identified gamification as "the use of video game mechanics and techniques to increase engagement and interest in an activity which is, usually, unrelated to video games" (Goehle, 2013). With this being said, we can spot two essential elements in all these definitions: the use of game mechanics and engaging or changing people's behavior. At this point, there is a clear distinction between the notion of gamification and educational games. While the main purpose of educational games is to entertain first and then teach certain content to their users, gamification seeks to apply the mechanics of gaming to non-game activities to effect a certain behavioral change (Goehle, 2013). These gaming mechanics are the aspects that make game play challenging, fun, satisfying and any other emotions the game designers intend to evoke. Examples of game

mechanics include: points, levels, challenges, virtual goods and spaces, leaderboard and gifts (Bunchball, 2010).

Gamification Elements Design

A gamified system is made up of certain building blocks, derived from games, which have the power to enhance motivation and learning (Bunchball, 2010; Kapp, 2012). However, merely adding game elements to a context does not guarantee learners' engagement nor the increase of their motivation, rather an adequate design, where the implementation of game mechanics align with the learning purposes and context, would ensure the benefits of gamification

Game Mechanics

Researchers have identified various game mechanics, but for the purpose of this study, I focused on three popular elements that the study platform integrates: points, levels and reward structures.

1. Points

Kapp (2012) stressed the importance of points in helping players identify how far they have progressed through a gamification experience. Similarly, Zichermann and Cunningham (2011) are of opinion that points are an absolute requirement for all gamified systems. The use of points can serve several purposes: to reward progress, correct answers, achieve social status and unlock content (Kapp, 2012) or to see how players are interacting with the system, design for outcome, and make appropriate adjustments (Zichermann & Cunningham, 2011). Furthermore, gamification makes use of a wide range of point systems depending on the type of experience it is designed for. Zichermann and

Cunningham (2011) suggested several types of point systems. Experience Points (XP) are the most popular gamified reward system to rank and guide players. Redeemable Points (RP), on the other hand, can be used in exchange for things (weapons, goods, food, etc.). Unlike XP and RP, Skill Points (SK) are a set of points that allow players to gain experience points (XP) for tasks and activities alongside the main ones. Finally, Karma Points (KP) or giveaway points are not meant to be kept but to be shared to enhance the sense of altruism. The utility of points as an effective element in designing gamification has been the focus of many studies. De Byl and Hooper (2013) implemented a gamified curriculum structure, in which XP (experience points) were awarded instead of grades, to increase engagement of 31 undergraduate students. The study revealed that game mechanics in the form of points can provide an engaging meta-layer to existing educational content. In a related study, Iosup and Epema (2014) designed a gamified toolbox for one undergraduate and one graduate courses that adapt to different learning styles using a set of game mechanics, mainly experience and redeemable points to boost student engagement in technical higher education. The findings suggested that gamification can help increase students' passing rates and participation as well as their academic satisfaction. In an attempt to investigate the efficiency of game mechanics in engaging students and encouraging them to work consistently and to improve their learning abilities, Leong and Yanjie (2011), at the National University of Singapore, implemented *JFDI Academy*, an online learning platform that supplemented an undergraduate course on programming methodology taken by first year undergraduate students in the School of Computing. The platform allowed students to submit their assignments and to get explanations from tutors. As students do and submit assignments, they gain

experience points, and level-up. Although the two researchers argued that game mechanics can be efficient only when coupled with a strong academic design, a quick grading process and a close interaction with students, the study reported an improvement in the average assignment submission times (from less than a day to more than two days) and an increase of students' engagement and motivation to work and excel beyond what was required.

2. Levels

To better meet the need of an appropriately challenging gamified experience, the use of different levels is crucial. According to Zichermann and Cunningham (2011), levels serve as a marker for players' progress, or they can define either the difficulty or the leading element of the game. Kapp (2012) identified three types of levels: mission-based structure (players' progress from one level to the next throughout the game), degree of difficulty (players choose the degree of difficulty it suits them) and level of experience (degree of experience the players receive playing the game). To ensure a smooth progression of levels, each level should first help the story narrative move forward so that players feel compelled to know how the game will end. Second, each level should help players build and reinforce their skills starting from basic ones such as: how to navigate and how to use a weapon, to more advanced skills. Then, each level should require players to use previously learned skills to win the whole game (Kapp, 2012). This concept of incorporating different gameplay levels within a gamified context has the potential of accommodating the various abilities and experiences of players as well as helping them accomplish tasks not otherwise possible, and therefore catching their attention throughout the game. In this context, Barata, Gama, Jorge and Gonçalves (2013) studied a gamified college

course which incorporated levels, experience points, challenges, leaderboard and badges to examine how gamification can improve the learning experience. This experiment showed that, with gamification, students' participation in the forums as well as their engagement were enhanced significantly, and they also paid more attention to the class slides. This helped students to score better and the grade differences between them decreased. Similarly, Goehle (2013) integrated two game mechanics: levels and achievements in an online platform called *WeBWorK* to enhance students' engagement with math homework assignments. The 60 participants were awarded XP points for every homework answered correctly. Once they achieve a certain XP thresholds, they progress to the next level. The study results indicated that not only over 50% of students engaged with the program, they also enjoyed the positive reinforcement and realized that the used game mechanics provided them with concrete objectives that they could accomplish.

3. Avatars

Avatars are the virtual representation of physical players in the game. Several studies have focused on the advantages such avatars would add to the process of gamification. Zichermann and Cunningham (2011) argued that allowing players to customize their avatars in games will help add values to their experiences. They also claimed that using avatars instead of real identity would help players avoid embarrassment in a real context when asking questions. Fox and Bailenson (2009), on the other hand, suggested that deep behavioral and attitudinal changes happen when being an avatar. A significant change that they have mentioned is that watching avatars that represent players would influence them to perform the same activity as avatars in the future. In addition, Kapp

(2013) highlighted several advantages to using avatars as a social model. They can be implemented to project desired behaviors via distance whenever and wherever instruction is required. Besides, avatars can be modeled in a virtual world where behaviors are desired to occur contrary to face-to-face instruction. In a research study led by Smith and Baker (2011), the authors examined the efficacy of a game called *LibraryCraft* in introducing 338 new undergraduate students to the university library and its services. During the game, students selected avatars to represent themselves, and then completed a variety of tasks as they visited the library's website. The tasks involved answering questions about the library services or searching for books and articles. Each correct answer awarded students with points and unlocked a new chapter in the game allowing players to progress. Through surveys, the study concluded that the game, especially the use of avatars, taught students more about library resources and research skills in an entertaining way. In a related study, Perry (2015) explored the potential of a mobile learning tool called *Explorez* in assisting first year university students to learn French outside their classrooms. The gamified platform uses GPS to transform the campus of the University of Victoria, B.C. into a virtual French-speaking environment, where students interact with virtual characters in French using avatars of their choice. Besides avatars, *Explorez* includes other game mechanics, such as points and badges. The study participants ranked quests and collaboration with teammates as the main motivational factors in their learning followed by badges and then creating avatars.

4. Reward Structures

Rewards are one of the most important aspects of gamification because they are fabulously motivating for learners. There are various opinions about the nature

and the structure of rewards. Kapp (2012) differentiates between two types of rewards: completion rewards and measurement rewards. Completion rewards inform the learners on whether the task has been finished or not instead of how well they did it. Measurement awards, on the other hand, evaluate the learners' performance either against other learners' performances or against standards set by the game. Kapp (2012) stresses the importance of using measurement instead of completion rewards to engage learners by feedback and increase their intrinsic motivation. However, Zichermann and Cunningham (2011) identified another reward system referred to as SAPS (status, access, power and stuff). Status, the most popular reward element, is the position of players vis-à-vis the others within a gamified situation. Examples of status elements include badges and leaderboard. Access refers to the possibility of obtaining an exclusive access to items, advantages, or services; for instance players can use a new weapon or have access to a special skill in a game. Similarly, providing power to your learners allows them to enjoy a certain control over other learners in the game. However, stuff is considered the least important reward system because it consists of giving away items to players. Even though stuff may look a strong incentive to learners, it might have the potential of decreasing their intrinsic motivation once it is redeemed (Zichermann & Cunningham, 2011). In an interesting intervention, O'Donovan, Gain and Marais (2013) incorporated badges and leaderboard into student portal at the University of Cape Town to encourage students taking Computer Games Development course to attend lectures, understand content, develop problem-solving skills and enhance their engagement. Through course grades, lecturers' evaluations, lecture attendance and questionnaires, the study findings revealed that gamification techniques, mainly leaderboard and badges,

enhanced students' understanding and their engagement with the course. The same results were reported by an experiment led by de-Marcos, Dominguez, Saenz-de-Navarrete and Pagés (2014) which tested both social networking and gamification in terms of their effects on students' achievements, participation and attitudes in Qualification for Information and Communication Technologies course. The first instrument was a gamified plug-in deployed in the *BlackBoard* learning management system which allowed students to gain badges on completion of each level and also on participation in the e-learning platform. The gamified system implemented a leaderboard that provided participants with the opportunity to compete and to compare their performance with the others. The other instrument was a social networking website called *Elgg* which offered students and lecturers the possibility to chat using blogs, video tutorials for each activity in the course, a commenting and liking function to evaluate uploaded content, etc. Although the reported results suggested low participation rates and scores with both platforms, it has been found that the new tools presented better performance levels in regards to academic achievement for practical assignments related to skill acquisition, and the participants' perceptions were positive towards the usefulness and the layout of the content.

Game Dynamics

If game mechanics are seen as the toolbox used to create games, game dynamics are considered as the players' interaction with these mechanics. In other words, game dynamics determine the way players respond to the mechanics of the system either individually or with other players (Zichermann & Cunningham, 2011). The same authors argue that combining game mechanics with game dynamics can help develop game experiences that address specific players'

expectations, resulting in higher engagement (Zichermann & Cunningham, 2011). The following pages will focus on four popular game dynamics that the study gamified system incorporates: feedback, freedom to fail, rules and challenges.

1. Feedback

One important feature of an engaging gamified experience is the frequency and immediacy of feedback. The role of feedback is to ensure that learners receive adequate information about their progress (Zichermann & Cunningham, 2011). For Kapp (2012), feedback informs players about their performance and progress compared to the others and evokes the right behavior, thoughts and actions to reach the final goal. In order to create a gamified situation, special consideration should be allowed to the type of feedback is most appropriate to learners. The first feedback identified by Kapp (2012) is Conformational Feedback. It informs the players whether their actions or responses are right or wrong, but it doesn't tell them how to make corrections. The second type of feedback is called Corrective Feedback. If players fail to do the right thing, this feedback provides them with the appropriate knowledge and guidance towards the desired instructional outcome. Another important type of feedback is called Explanatory Feedback. It provides players with explanations and justifications behind a correct response or action. This has the potential of helping learners encode knowledge in an effective way. The last type of feedback is Diagnostic Feedback. It helps identify misconceptions players are likely to be thinking about by the time they choose the incorrect response (Kapp, 2012). For the purpose of investigating how social games might be taken advantage of for educational and learning outcomes, Landers and Callan (2011) combined various game mechanics and dynamics to create a social networking platform for undergraduates taking Psychology courses

at the Old Dominion University. The gamified platform, called *socialPsych*, was intended to encourage participants to complete optional multiple choice quizzes during their free time. Among other game dynamics, instructors' feedback on learners' performance was provided during and after practice. This study has concluded that immediate feedback is a crucial motivational element that has the potential of improving learning in both higher education and employee training. In the same context, the experiment of O'Donovan, Gain and Marais (2013) made use of quizzes and puzzles that had immediate feedback, allowing students to be rewarded instantly with experience points (XP) if their answers were correct. In terms of benefit to learning outcomes, participants ranked quizzes and the rapid feedback associated to them as having the highest positive impact.

2. Freedom to Fail

As Kapp (2012) has argued, the replay or the do-over has been underestimated as a gaming element. Allowing learners to fail encourages them to test hypotheses, explore a set of rules and remember the efficient approaches to win over the less efficient ones (Kapp, 2012). In this way, players feel a certain freedom to explore multiple options for winning and therefore develop their sense of curiosity and discovery. Besides, it is widely known that winning without struggle or failure is not always an enjoyable experience. Feeling the difficulty and gaining knowledge enhance the learner's sense of accomplishment and triumph (Kapp, 2012). This reduces learners' fear and anxiety and gives them ample time to practice and apply the gained knowledge as they move up from one level of difficulty to the next (Gee, 2003). Gordon, Brayshaw and Grey (2013) conducted a long study (over a decade), with around 2000 first-year university students to examine the effects of game mechanics and dynamics on students'

engagement and achievement of the target learning outcomes. Gordon and his team adopted several game dynamics, mainly *multiple lives and multiple attempts*. Multiple lives encouraged students to try to re-answer specific questions by allowing them five chances to use in each game. Multiple attempts, on the other hand, let players try the activity the number of times they wish to achieve at least a passing grade (40%). The results of the study indicated that allowing multiple attempts/lives (freedom to fail) enhances students' engagement with the learning materials. Similarly, Hentenryck and Coffrin (2014) explored the possibility of adapting a classroom format for teaching discrete optimization to a MOOC version. The adaptation process required the study to address a number of challenges. First, the automated grading process along with the leaderboard made the MOOC assessment identical to the classroom format. Then, in a MOOC, the student body is less homogenous than in a regular classroom, but making the content always available online helped students to go at their own pace and to plan their study schedule around their life constraints. Furthermore, to address the lack of social interactions, the MOOC allowed unlimited number of assignment submissions. With this, students were free to fail, and they could seek feedback whenever they wish. Hentenryck and Coffrin (2014) found that students took great advantage of the freedom-to-fail aspect with an average of 5.9 times submissions for each participant. Although the overall results revealed that both the MOOC and the classroom versions yielded the same learning outcomes in terms of overall experience, time commitment and difficulty, data reported by the MOOC suggested that the course design had positive effects on both participants' motivation and online learning.

3. Rules

Rules are established within a gamified context to ensure the learning goals are obtained fairly. In fact, Dichev, Dicheva, Angelova and Agre (2014) argued that rules allow players to feel a sense of achievement and engagement as they abide by these rules to advance towards a set of objectives. In the same context, a learner's engagement with a gamified context can be attributed to the guidelines and boundaries rules provide (Kapp, 2012). Four types of rules that can be applied within a gamified learning experience have been identified: operational rules, foundational rules, implicit or behavior rules and instructional rules. Operational rules are simply guidelines and instructions on how to play a game. Foundational rules, on the other hand, are abstract and tend to be understood most of the time by the designer of the game alone because they constitute the underlying formal structures on which a game functions. Implicit or behavior rules are the game etiquette that regulates the social contract between players. Although implicit rules are often unwritten, their violation imposes certain penalties. Instructional rules are the most valued set of rules you want learners to internalize as far as gamification is concerned because they are the reason the gamified situation has been set in the first place (Kapp, 2012). Aseriskis and Damasevicius (2014) gamified a project management system called *Trogon* by combining the entire system with a gamification model. Other than a leaderboard and a badge system, the module had a set of instructional rules such as: every player can be awarded a badge if the job is done, every badge defines a specific skill, special bonuses are given to skilled employees, a badge can be withdrawn by a project manager if the quality of the task done is low or the time spent on it is too long, and the quality assurance manager can remove the player's badge if the work done contains too

many defects. Thanks to the integrated set of rules, the 60 participants in the study evaluated the gamified module as having a high usability score (71 out of 100 points).

4. Challenges

One way to intrigue learners and keep them hooked is to add a challenging content. A motivational challenge within a gamified environment direct players to what should be done, and therefore keep them connected with the game (Zichermann & Cunningham, 2011). Challenges have the potential of initially engaging learners into a task and encouraging reluctant ones to start learning content (Kapp, 2012). However, designing a gamified experience requires a careful balance between the level of difficulty and learners' abilities. If learners find the challenges far too hard, they may get overwhelmed, and therefore get frustrated and give up. On the other hand, if the gamification experience is too easy, they will lose interest. Thus, keeping players between boredom and stress is what makes them fall into a state of flow (Kapp, 2012). To do this, Kapp (2012) suggests several techniques to create effective challenges, some of them are: chunk information in consumable clusters, sequence information to make it relevant to players, scaffold players and shift rules to alter the player's current strategy (Kapp, 2012). Li, Grossman and Fitzmaurice (2012) evaluated the use of a gamified tutorial platform called *GamiCad* to help new users learn and enhance their performance with *AutoCad* software. The design of *GamiCad* made use of the *Mission Console*, which, in turn, contained four mission pages. Players had to complete a certain number of tasks to move on to the next mission. In addition, the gamified platform helped players develop their skills by using progressive revelation of both knowledge and challenging levels. The qualitative results

showed that many participants wanted to challenge themselves by repeating tasks to score higher points, and there were others who enjoyed the missions' format of the platform and the elements of challenge, such as: timer, storytelling and competitive levels. Li and his team concluded that *GamiCad* allowed the learning content to be enjoyable, engaging, fun and effective. The same findings have been reported by Flatla, Gutwin, Nacke, Bateman and Mandryk (2011). The authors explored the utility of certain game mechanics and dynamics in the creation of *Calibration Games* that would help the users gather calibration data (human abilities and limitations as well as systems and technologies) in an enjoyable way in order to correctly configure devices and interfaces. Among the various game dynamics deployed in the design of the platform, the clear task goals triggered challenging activities that players engaged in as the game progressed. A challenge that participants were facing was to keep accuracy around 100% and to achieve a higher score while shooting their targets in less than 10 seconds. At the completion of each level, players were rewarded with missile symbols and explosion sound effects. The study revealed that the gamified version of calibration was more enjoyable and motivating than the standard version, thereby strengthening the performance and accuracy of several human-computer systems.

Gamification Elements Vs. Motivation

There is a rich literature that has examined the importance of motivation when it comes to learning. In the 1950's till the 1980's, most of the research about motivation was dominated by scholars such as Skinner and Bruner. However, most of the research in the field agrees that motivation happens when a learner finds academic activities meaningful and worthwhile, which results in an attempt to derive the intended academic benefits from them (Glynn & Kobolla, 2006). In

this context, one of the powerful learning aspects in game-based design is its capacity to motivate participants and to allow them to develop new skills and utilize those skills in the real world (Rouse, 2010). Nikkila (2013) reported four aspects of game design related to user interaction that have the potential of maintaining engagement of participants over a long period of time. Those aspects are: simple and ubiquitous interaction, providing responsive feedback, lightly competitive and simple rules.

Another examination of the previous research has revealed several studies which have explored the effects of using game elements and mechanics on student engagement and motivation. Dominguez, Saenz-De-Navarrete, De-Marcos, Fernández-Sanz, Pagés and Martínez-Herráiz (2013) study examined the use of gamification in a web-based education as a tool to increase student motivation and engagement. The research team has designed and built a gamification plug-in for a university course e-learning platform. Even Though the results showed that the experimental group performed poorly on written assignments, gamification features have had great emotional and social impact on participants thanks to reward systems and game-like mechanics used in the study. Leaderboard and badges, for instance, served as motivational factors because participants' work was instantly recognized. In a related study, Mejia (2013) conducted a study to determine the relationship between the use of game-like elements and smartphones' application engagement. The experiment enhanced an existing campus app with game features, and then it was integrated into a series of situated displays. The overall results concluded that the participants' engagement increased compared to previous months. At the same time, the users had more frequent activity with the app.

However, a review of 34 peer-reviewed papers that discussed the use of game elements in various educational contexts have revealed mixed results. While 21 papers reported promising results, 2 reported negative effects and the rest was not evaluated (Dicheva, Dichev, Agre & Angelova, 2015). However, only 10 provided some guidelines regarding the design of game elements. Previous empirical research or experiments related to gamification have looked at its effects on behavior change rather than examining its design. Although findings claim that adding game elements to content or structure can enhance a desired behavior, little concern has been given to design strategies or principles that can affect users' experience.

One of the pitfalls of gamification has been the addition of game elements as a "scoring system" to a non-game context without a healthy design. Robertson (2010) suggested the term "pontification" to describe gamification that merely adds a scoring system (points, badges, leaderboard) and leaves fun and play behind. Zichermann and Cunningham (2011) argued that a scoring system can be an appropriate choice to engage customers with a product as long as the rewards are never removed. Besides, game elements can be an effective engaging factor when the target skill includes real-life benefits such as learning a software (Nicholson, 2012).

On the other hand, reward-based game elements may undermine internal motivation, leading to a low performance. In their meta-analysis, Deci, Koestner and Ryan (2001) evaluated 128 studies that examined motivation in primary and secondary school. They state that all sorts of rewards (unexpected tangible rewards, task-non-contingent tangible rewards and expected tangible rewards) except verbal rewards tend to decrease intrinsic motivation. However,

Zichermann and Cunningham (2011) argue that extrinsic rewards, such as long-term social status rewards can be highly motivational in gamification as they foster creativity and play. They admit, though, that keeping players' intrinsic motivation depends on keeping them in the reward loop forever (Zichermann & Cunningham, 2011). Instead of focusing on rewards, Deci, Koestner and Ryan (2001) suggest that it is rather more appropriate to focus on effective ways of facilitating intrinsic motivation such as taking students' perspective into account when developing learning activities, providing them with choices, ensuring the activities are optimally challenging. In this way, we can expect an increase of the type of motivation that is found to promote conceptual understanding and creative task engagement (Deci, Koestner & Ryan, 2001).

"Situational relevance" is another concept that is closely related to motivation and its effect on gamification. The concept explains how the relevance of a task can be important to users if it matches their interests and needs (Nicholson, 2012). Similarly, in a reward-based gamification, the scoring system is less likely to be relevant to users if the task to be measured is not relevant to those users' interests. For instance, a gamified structure which is meant to encourage political voting is likely to lead positive results if it targets users who are internally concerned with politics; otherwise it is not going to be relevant to them. With this being said, Nicholson (2012) suggests involving users in creating and developing gamified systems that match their background and address their interests if our objective is to craft meaningful gamification.

Gamification Design Theories

Malone's Heuristics

In an attempt to examine how the features that make games captivating can be used to make learning interesting and enjoyable, Malone (1981) used a series of empirical studies to outline a set of heuristics that make use of game elements to design an enjoyable learning environment.

I. Challenge

A. Goal: A challenging environment has to be meaningful, obvious or easily generated and supported by performance feedback.

B. Uncertain outcome: to make an environment challenging, goals should made uncertain through: variable difficulty levels, multiple level goals, hidden information and randomness.

C. Tools: to increase a challenge in a game, tools should be made reliable, efficient and usually invisible.

D. Self-esteem: challenges in a game should be inviting rather than discouraging to avoid damaging users' self-esteem.

II. Fantasy

A. Intrinsic and extrinsic fantasies: Intrinsic fantasies (the skill depends on the use of fantasy) are more interesting and instructional than extrinsic fantasies (the fantasy and skill depend on each other).

B. Cognitive aspects of fantasies: metaphors and analogies used in intrinsic fantasies can help users apply old knowledge to understand new things.

C. Emotional aspects of fantasies: fantasies are appealing because they satisfy the emotional needs of players.

III. Curiosity

A. Sensory curiosity: it involves audio-visual stimuli, such as graphics and sound.

B. Cognitive curiosity: learners' curiosity is better engaged when their current knowledge is incomplete, inconsistent or unparsimonious. In this way, they are much motivated to learn more to enhance their cognitive structure.

C. Informative feedback: feedback has to be surprising and constructive to engage players' curiosity.

Several researchers have used Malone's heuristics to incorporate game elements into their gamified systems. Li, Grossman and Fitzmaurice (2012) evaluated the use of a gamified tutorial platform called *GamiCad* to help new users learn and enhance their performance with *AutoCad* software. The design of *GamiCad* made use of Malone's *Fantasy* feature to engage players. When they launch the game, users are introduced to a story which explains that their mission will be to help NASA (The National Aeronautics and Space Administration) build a spacecraft. Results concluded that *GamiCad* allowed the learning content to be enjoyable, engaging, fun and effective. Similarly, Flatla, Gutwin, Nacke, Bateman and Mandryk (2011) explored the utility of Malone's three concepts (challenge, fantasy and curiosity) in the creation of *Calibration Games* that would help the users gather calibration data (human abilities and limitations as well as systems and technologies) in an enjoyable way in order to correctly configure devices and interfaces. Among the various game elements deployed in the design of the platform, the games included clear task goals that would trigger challenging activities that players engaged in as the game progressed. The components of the

calibration system were put in a fantasy context to create a certain vicarious game environment. Then, curiosity was implemented in the form of rewards placed at random locations to engage players cognitively. The study revealed that the gamified version of calibration was more enjoyable and motivating than the standard version, thereby strengthening the performance and accuracy of several human-computer systems.

Smart Gamification

Amy (2010) argued that gamification is not only about adding simple game mechanics like badges, points and leaderboard to websites and apps, but it seeks also to create game-like digital services that would shape players' experience using a blend of intrinsic and extrinsic motivations. She suggests seven core concepts for a Smart Gamification that would produce more engaging products and services:

1. Know who's playing – design for their social style.
2. Build a system that's easy to learn and hard to master.
3. Build fun/pleasure/satisfaction into your core activity loop.
4. Use Progress Mechanics to "light the way" towards learning and mastery.
5. Design for onboarding, habit-building, and elder game.
6. As players progress, unlock greater challenges, customization and privileges.
7. Give players real power via stats, voting, earned roles, and crowd sourcing.

Meaningful Gamification

In an attempt to suggest an alternative for reward-based gamification, Nicholson (2012) introduced “Meaningful Gamification” which recommend using play to engage players in a ludic learning experience instead of external rewards or a scoring system that have the risk of decreasing intrinsic motivation (Nicholson, 2012). The three strategies Nicholson outlined are the following:

Focusing on play-based gamification elements

For players to find meaning and build internal motivation, designers are invited to create an information-based space where participants can freely explore the system and then seek deeper levels of engagement. Besides, thinking of activities as simulations rather than games can raise the emphasis on play and decrease the focus on scores by allowing players to explore the system in the way they think it is meaningful without scoring-based penalties.

Creating transformative opportunities through participatory activities

Nicholson (2012) argues that a key element of transformative learning is to set up activities that foster reflection and new perspectives on the world through creating play spaces where players can engage with the non-game context intellectually and emotionally. Role-play, reflection on one’s own viewpoint and sharing those viewpoints are other methods to put together play activities and reflection.

Thinking in three dimensions to create a ludic learning space

Planning for play-based gamification as a design for a real-world space would be much engaging than it would be for a virtual world as it helps create

activities that are easier for players to understand, and it provides not only places to play, but also spaces to socialize and reflect as in a real-world context.

Werbach's "6 Ds"

According to Werbach and Hunter (2012), any gamification project needs a process to make it successful. This process includes emotional elements such as fun, play and user experience as well as measurable systems to serve concrete objectives. The authors suggested a design framework that involves the following six steps:

Define business objectives

Having a clear understanding of your goals is the first ingredient any gamification project requires; otherwise it might get off the ground and then will be doomed to fail. To do so, Werbach and Hunter (2012) recommend making a list of potential objectives, then breaking them down to precise goals, and finally ranking those goals in term of importance.

Delineate target behaviors

Once objectives are identified, focus will shift to what players are expected to do and how to measure it. Target behaviors should first be concrete and measurable and should support the ultimate objectives outlined for the project. To measure target behaviors, Werbach and Hunter (2012) suggest using points because they are an easy way to quantify any kind of progress.

Describe players

Designers have to put themselves in the shoes of the players to identify what motivates and what demotivates them. Also, the gamification project has to address different needs as players are not the same. Bartle (1996) distinguished four types of players: Achievers who love to level up, Explorers who are eager to know new content, Socializers who love to engage with friends and Killers who want to dominate others by vanquishing them. In this context, any gamification platform has something to offer to each type of players. The last aspect to consider is the player lifecycle. Novices need scaffolding and reinforcement, regular players need novelty to engage them, and experts need challenges that are hard enough to keep them hooked.

Devise activity cycles

Gamification is not linear because it functions through various loops. In other words, the gamification design should be done through activity cycles: each activity provokes the other one. The first cycle is engagement loop where players' motivation results in actions. Those actions, in turn, produce feedback, and so on. The second cycle is progression stairs which involve escalating the level of challenges as the players move through the game. A major challenge at the end of the line and small positive surprises are two additional aspects designers are recommended to consider to help players feel a certain emotional satisfaction.

Don't forget the fun!

If the gamification project is perceived as fun, players will absolutely engage with it. There are four types of fun: "Hard Fun" whose pleasure includes overcoming a challenge, "Easy Fun" which is simply a casual enjoyment, "Experimental Fun" which involves the joy of trying out new experiences and

"Social Fun" that is reached through interaction with others. Ideally, a gamified platform should incorporate different types of fun to appeal to its players.

Deploy the appropriate tools for the job

This stage involves using the appropriate mechanics and dynamics and coding them into the system. In other words, it is the stage where all ingredients are put together to craft the whole experience. Werbach and Hunter (2012) claim that calling for external expertise to help implement the project, would make the design process much easier. Kuutti (2013) examined the use of Werbach's "6 Ds" to find out what motivates participants to use gamified products and services in the view of designing a gamified framework suitable for marketing. The study included four small to medium sized companies and used interviews as a main instrument for data collection. Findings revealed that while defining business objectives is proven to be the first most important step to begin with, the rest of the steps can follow in a flexible order that suit the gamified project to be implemented. In addition, after launching the gamified project, two more steps can be added to the design framework. Tracking and further development can ensure the gamified system will be adapted to users' needs (Kuutti, 2013).

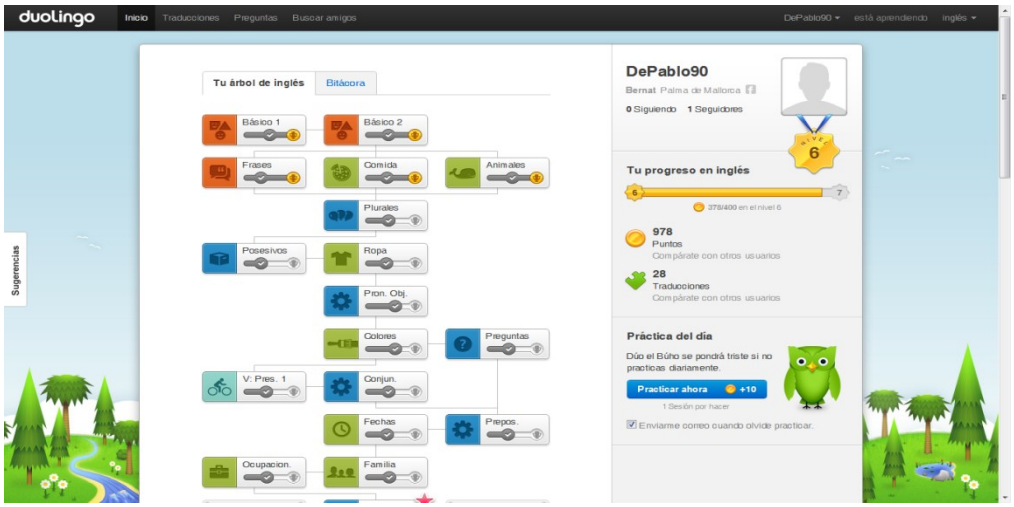
Based on the review of the existing literature, gamification is a relatively new phenomenon that has considerable potentials in user motivation; however, as Nicholson (2012) and Deterding (2012) have argued, adding points, badges, and leaderboard is implementing the least essential game elements to the core of the experience. This becomes problematic because the participants may become more dependent on the point system rather than the target activity (Pagowsky, 2013). In this way, Pagowsky (2013) added that rewards may damage existing engagement

in the sense that removing points, badges, and other engaging charms may result in users becoming totally demotivated with both the gamification format as well as the non-game activity. In fact, using one of these theories when designing a gamified learning system should make it a tool rather than a controlling force to help users relate personally to the content, and thus get more engaged and motivated to benefit much from the non-game activity.

Examples of Classroom Gamification

Duolingo

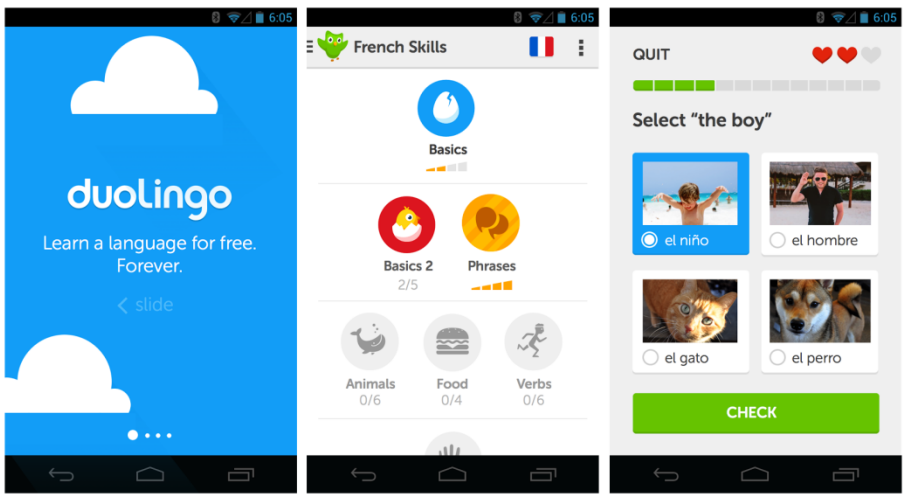
Duolingo is a widely popular online and mobile platform for language learning. Lessons focus on the main language-acquisition competencies, mainly speaking, listening, reading and writing. As far as the content is concerned, lessons are clustered according to semantic themes, such as “animals” or grammatical themes, such as “possessives”. The activities include sentence or phrase translation, dictation and repetition of a spoken or a written structure.



A screenshot of Duolingo program

However, to illustrate certain grammatical concepts, *Duolingo* exposes users to some useless and nonsensical sentences, such as: “they come from the woman”, “I have my cow” and “the elephant drinks milk”. Besides, it uses a computerized voice system for all listening activities, which makes it quite hard for users to learn and speak the way it sounds in reality.

Duolingo also incorporates different game mechanics. Users can gain XP (experience points) and level up as they take lessons and finish practice sessions. Accumulating XPs allow learners to earn Lingots (a virtual currency), which they can use in the virtual shop. The online platform features also a leaderboard that shows the player’s progress and strength on each language competency. *Duolingo* scores another point in favor of learners’ autonomy because it allows them to adapt their learning pace to their language skills. Users might skip certain lessons if they succeed in special quizzes, which prove that they have the necessary skills to move to the next level.

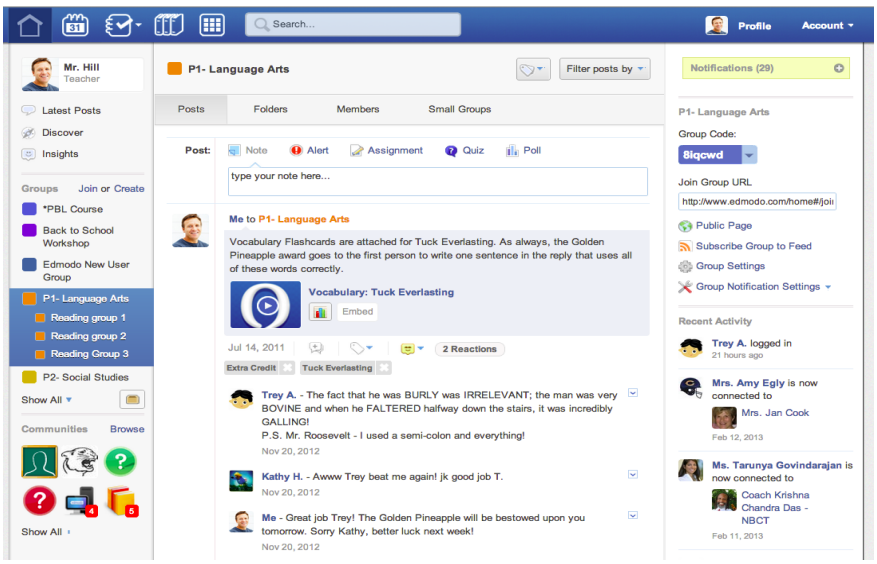


A screenshot of Duolingo mobile app

Although *Duolingo* is considered by many users to be fun and compelling, certain features need improvements. First, users can earn dozens of lingots as they acquire skills, but there are few ways to use them as the lingot store runs out of interesting and appealing stuff. Moreover, at advanced stages of learning, *Duolingo* deprives users from getting badges regardless of the amount of efforts they can put into it, which might have serious consequences on the pace and the motivation of learners. Evan though *Duolingo* integrates social network, such as Facebook, it lacks cooperative events and challenges where users can form teams and compete against each other.

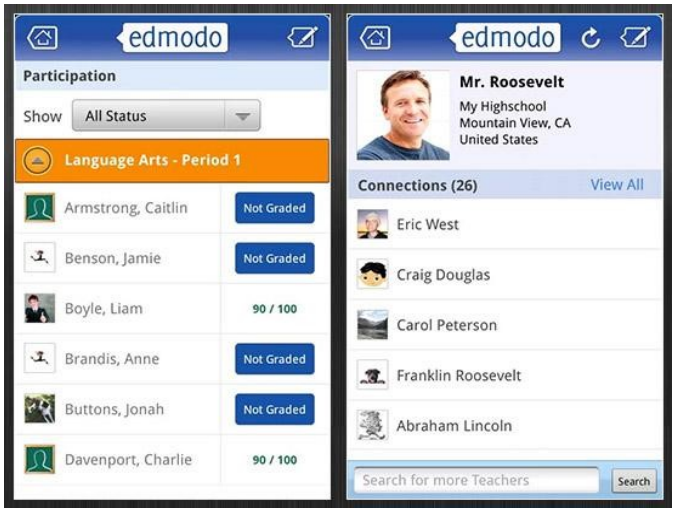
Edmodo

Edmodo has gained a significant popularity among teachers as a learning management tool. Having the look and the feel of Facebook, the online platform has all features of a user-friendly LMS. It includes: learning communities, discussions, a sharing space, assessment tools, scheduling tools and much more.



A screenshot of Edmodo program

As a gamified system, *Edmodo* allows users to keep track of their progress through grades and badges that teachers can assign. Parents, too, can log in using their codes to get feedback on their kids' academic advancement and to communicate directly with their teacher. In addition, when students complete tasks, they can level up and, thus, move to further challenges. The application also makes it easier for students to collaborate in small groups to complete assignments, which fosters motivation and engagement.



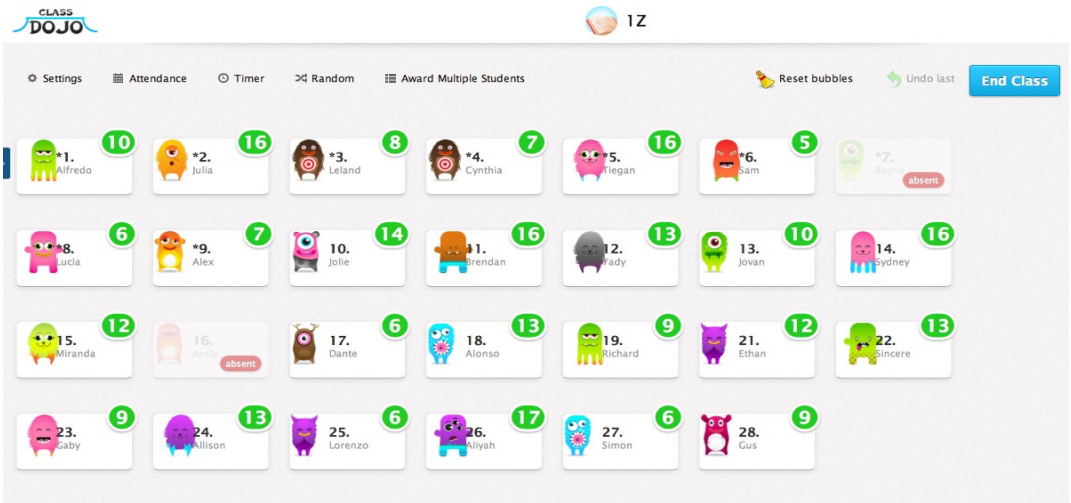
A screenshot of Edmodo mobile app

Clearly, the advantages of *Edmodo* outweigh its drawbacks. However, the mobile app, mainly the iPad version, is not yet a fully-fledged functional platform. Users not only can't embed media in discussions and assignments, but they can't turn in unfinished assignments or save their drafts for a later use as well. Moreover, teachers find it too hard to evaluate and grade assignments on

their mobile gadgets without downloading them and re-uploading them with their feedback.

ClassDojo

ClassDojo is a classroom management tool that allows teachers to encourage desirable behaviors by rewarding or penalizing students using "Dojo Points". Teachers can also customize their classroom goals and rules by adding labels for attendance, participation, homework completion or any other behavior they want to encourage in their classrooms. On the other hand, students can get an immediate feedback about their actions through a behavior report, which helps enhance or prevent a particular student conduct.



A screenshot of ClassDojo program

ClassDojo integrates different gamification elements. The system allows users to be rewarded with points and badges for their positive behavior. These incentives can be used later to get further awards outside of *ClassDojo*, such as:

stickers, free time, etc. Besides, teachers are invited to customize the feedback narratives according to their own needs before they can be displayed. Then, an immediate feedback can be given on a daily, a weekly or a monthly basis to allow students to monitor their progress and a generated report can be sent to parents to engage them in the overall management process at home too. With *ClassDojo*, learners can represent themselves using customizable monster avatars to get points or upload their own images or icons. The system also features a mobile app that is available for both Android and iOS users. This application frees teachers from being trapped at their keyboards; instead, they can control and monitor their students' behavioral progress wherever and whenever they want.

A screenshot of ClassDojo mobile app

Nevertheless, users of *ClassDojo* have reported a limited use of the mobile app. It is quite impossible to manage class lists, such as creating a new class or adding students to existing classes. Another drawback of *ClassDojo* is the lack of challenges and cooperative aspects that have the potential of enhancing motivation and engagement; thus, the system can be blamed for promoting reinforcement to the detriment of learning.

Chapter 3 - Methodology

Study Design

A blend of quantitative and qualitative research methodology was used to address the aforementioned research questions. Qualitative methods were generally chosen because of their flexibility as they explore an issue and develop a detailed understanding of a central phenomenon (Creswell, 2012). The aim of this study was best realized through a grounded theory approach for two main reasons. First, the intentions behind the current study were more an inquiry into exploring the usefulness of gamification in an ESL learning context as a methodology to enhance student motivation, so qualitative methodology is usually useful when little is known about the phenomenon under study (Strauss & Corbin, 1990). Besides, several studies have examined motivation as an expected outcome of the use of gamification, but few of them have studied the intended motivational structure within an ESL context. Therefore, one advantage of using the grounded theory method is that it helps develop and relate categories or themes of information and compose a figure or visual model that portrays the general explanation (Creswell, 2012). The analysis involved dividing the data from the focus group interview into sections of text and assigning initial codes according to the meaning of each line in the text (line-by-line coding). Codes were grouped into higher categories (focus coding) until core categories are identified and a theory is generated. The researcher documented his thoughts, assumptions and any ideas in the form of memos throughout the analysis. Ultimately, prior to the qualitative analysis, a quantitative analysis was used to examine the participants' level of motivation before and after the intervention and to explore their perceptions of gamified learning compared to current teaching methodologies.

While the pre-experiment questionnaire was mainly designed to elicit the participants' attitudes and motivation towards regular English classes, the post-experiment questionnaire was more specific to the intervention; however both questionnaires addressed my research questions. This quantitative analysis lended great credibility to the qualitative findings through providing the instruments to quantify the degree of confidence in the study results (Abeyasekera, 2005).

Participants and Research Site

Description of Participants and Research Site

The population of this study was a convenience sample of 8 grade 10 high school students between the ages of fifteen and sixteen who were taking English courses as a part of their regular academic load. The study took place in the CSSMI (Seigneurie-des-Mille-îles) school board, Saint-Eustache in Quebec, primarily in Rive-Nord high school. This school was chosen because of its accessibility for the researcher and because of a considerable number of its newly arrived students who were mainly transferred either for their low academic achievement or for their lack of motivation (incomplete assignments, absenteeism, etc.).

Obtaining Research Site Permission

To gain entry into the research site, the researcher took a series of steps. These steps included: meeting with Rive-Nord high school principal to outline the purpose, the importance and the role of the participants in the study, gaining the Concordia University approval for conducting the current study by completing

and signing the required paperwork and getting the participants and their parents' informed consent signed.

Criteria of Selecting the Participants

The participants were not be randomly selected because they were chosen from among the students who enrolled in the researcher's classes, so he selected them according to the following criteria:

- ✓ Failure in English in the 1st semester.
- ✓ Weakness (grades in English between 60% and 68%).
- ✓ Lack of motivation (lack of participation, incomplete assignments and missing homework)

Recruiting Participants

The researcher recruited the participants using a paper-based invitation (Appendix C) that included:

- ✓ Description and purpose of the study.
- ✓ Tasks students are required to do during the study.
- ✓ Students' decision (students were asked to sign the assent form if they accept the invitation)

Ethical Considerations

Protecting Participants and Data

To account for any ethical issue that may arise during the study, the researcher made sure the following measures were applied.

- ✓ The participants' names remained confidential to guarantee confidentiality.
- ✓ The researcher informed the participants and their parents via consent and assent forms of the voluntary nature of their participation, and that their withdrawal from the study or their refusal to answer any question in the survey was possible at any time during the study without penalty.
- ✓ The participants and their parents were also advised of the objective, data collection method and activities of the current study.
- ✓ Consent and assent forms (Appendix B and C) were distributed to the participants to be signed by them and their parents.

If a participant decides to withdraw from the study, information obtained from him or her were excluded from the analysis and destroyed at the end of the study. However, he or she still can ask the researcher to get a copy of the work done in class (copies can be transferred to participants' USB keys or flash drives).

Accounting for Dual Responsibility

Since the researcher accepted responsibility for dual roles (teacher and researcher) during this study, it is likely that some students may feel pressure to comply with requests made by their teacher thinking that not participating in the study may influence their grades. To address this issue, the researcher:

- ✓ Set up the study sessions during tutorial classes (lunch time) instead of regular classes;
- ✓ Made it clear that the activities done during the study did not count for their regular evaluation;

- ✓ Explained that participation, refusal to participate and withdrawal from the study did not affect the students' grades.

Motive for Selecting Participants

Because only some of the participants were being selected based on the criteria, the researcher explained the motive for selecting these students by:

- ✓ Introducing the purpose, the methodology and the study activities during a remedial class where the concerned students were present. That would be an opportunity for the researcher to be more open to questions and feedback from students about the study content and their participation.

- ✓ Explaining to the concerned students, in a remedial class, the importance of strengthening their skills in English during Sec 4 (grade 10). Mastering basic concepts at this stage would definitely help them find the next year concepts easier. Therefore, the researcher made it clear that the purpose behind their selection for the study is to help them deal with their weaknesses while having fun.

- ✓ If other students show an interest to participate in the study, the researcher would simply clarify that because the study was limited to a small number of participants, the subjects have been already selected.

It's only the selected students who knew the selection criteria, but the researcher used certain strategies to make a positive impact on the students and help them understand the benefits of the study, so he:

- ✓ Took 10 to 15 minutes of a remedial class to explain to students who were interested how participation in the research would be a learning experience for them and how the research would be beneficial for their success.
- ✓ Took 10 to 15 minutes of a remedial class to present "*Classcraft*" to students so that they can have an idea of the gamified platform they used during the study. The technological and the innovative aspects of the proposed website have the potential of hooking the attention of the students.
- ✓ Since the majority of students appreciate team and pair work, the researcher convinced the students that all the assignments and projects during the study will be done in teams.
- ✓ Make it clear to students that the study classes would look exactly as remedial classes. Therefore, the study would be another opportunity for the teacher to be available to help them address their needs. The only differences were: students used an online gamified platform instead of regular class materials, and they were asked to fill out questionnaires and to answer some interview questions.
- ✓ Through the assent and the consent forms, emphasized the fact that their withdrawal from the study or their refusal to answer any question in the survey was possible at any time during the study without any penalty.

Data Collection

This section explains the intervention schedule, the instruments used in the study and how data was collected.

Before any data was collected, Certification of Ethical Acceptability for Research Involving Human Subjects was gained from the Concordia University Human Research Ethics Committee (UHREC) (Appendix A), and then informed consent (Appendix B) and assent forms (Appendix C) from participants and their parents were obtained.

Data Collection Schedule

Since the study was done during lunch time, there might have been a schedule conflict. Students were usually invited to tutorials (classes held during lunch time to assist students academically in different school subjects), so some participants might have missed either the study sessions or tutorial classes. As a first step, the researcher checked the participants' tutorial schedule and then set up the study sessions accordingly so that scheduling conflicts could be minimized as far as possible. In case participants received tutorial invitations during one or more study sessions, the researcher would either arrange with the concerned teacher for the tutorial to be held at a different date or set the study sessions during lunch breaks where participants were free.

Therefore the study was conducted twice a week over a period of 5 weeks (see Table 1).

Table 1 Data Collection Schedule

Timeline	Week 1	Week 2	Week 3	Week 4	Week 5
Data Collection	Introducing Classcraft	Writing	Reading	Grammar	Reading
	Oral Production	Writing	Reading	Oral Production	

Data Instruments

The instruments used for the present study consisted of tutorial materials, and instructional materials which were designed to focus on the three main ESL (English as a Second Language) competencies: speaking, reading and writing.

Tutorial Materials

Because participants were going to use a platform with which they were not familiar, the researcher gave participants a 30 to 45 minutes tutorial on the main functionalities of "*Classcraft*", which included the following:

- ✓ Game rules
- ✓ Choosing game characters
- ✓ Options and functionalities
- ✓ Types of powers and how to get them
- ✓ Losing powers and consequences

The tutorial was given using a *Prezi* presentation and a couple of video capsules available on *Classcraft* website: www.classcraft.com. Besides, participants were provided with a Pdf document that outlines *Classcraft* rules and powers. This handout served as a visual aid to remind participants of details during the intervention. The researcher wrapped up the tutorial class with a short simulation of the main functionalities of *Classcraft* using two fake student accounts that he created before the tutorial.

Instructional Activities

In Quebec, the aim of the ESL program is to enable students to use the target language in communicative situations effectively. For this reason, the Ministry of Education, Recreation and Sport (MELS) outlined three main competencies learners are required to develop and enhance. These competencies are: speaking, reading and writing. Hence, all the materials designed and used in this project had these three competencies as their main target. The following sections describe the tasks used in the project.

Speaking tasks

Role-plays. The task aimed at testing the students' ability to select and justify the use of survival items. For instance, participants were presented with the following scenario: "there is a huge storm coming towards Montreal and Laval. Experts expect the storm to last several days, and you will not be able to leave your house. You will need to stay in your basement for a few days until the storm passes. What things you think you will need to have with you in the basement?". After brainstorming participants about the items they will need, they took 10 minutes to select only ten items they think they are necessary using the worksheet

they were given, and then each team member took one minute to justify the choice of at least 2 items.

Guessing game. The guessing game was meant to assess the ability of the participants to define words/phrases for others to guess. Each group was given a set of cards face down, then each participant started describing the word until someone from the other group find it. Examples of words to guess are: a fine, a pickpocket, a flood, etc. The task required the participants to ask questions and give descriptions using full sentences.

Writing tasks

Story completion task. This task was a writing task which asked the participants to read 3 unfinished stories and then to imagine a dramatic or a funny end to one of their choice. The three stories' openings are presented below

> Peter worked for an oil company in Calgary. His firm sent him to work on an island in the Caribbean. Peter was very happy with his new job and he rented a house near the beach …

> Lenny looked unhappy. His friend Morris asked him what the problem was …

> John's cow was sick. He spoke to his neighbour, Sam, and described the symptoms …

Reading tasks

Quest for vocabularies. In this vocabulary activity, the participants were invited to work in groups. Each group chose a letter, and then everybody should

find a word that starts with the assigned letter for each word category. Examples of word categories are presented below.

Letter	City	Country	Fruits	Vegetables	Sport	Technology	Clothes	Jobs	Colors	Animals

Matching tasks. To brush up on grammar points (present and past tenses) seen in their regular class, participants were presented with an online quiz, where they had to pick up the right tense for each given statement.

Trivia quiz. Instead of assessing participants' understanding of a given text using paper-based classical formulas (true or false questions, completion tasks, direct questions, etc.), trivia quiz allowed the participants to answer a series of multiple choice questions online using their gadgets.

Instructional Tools

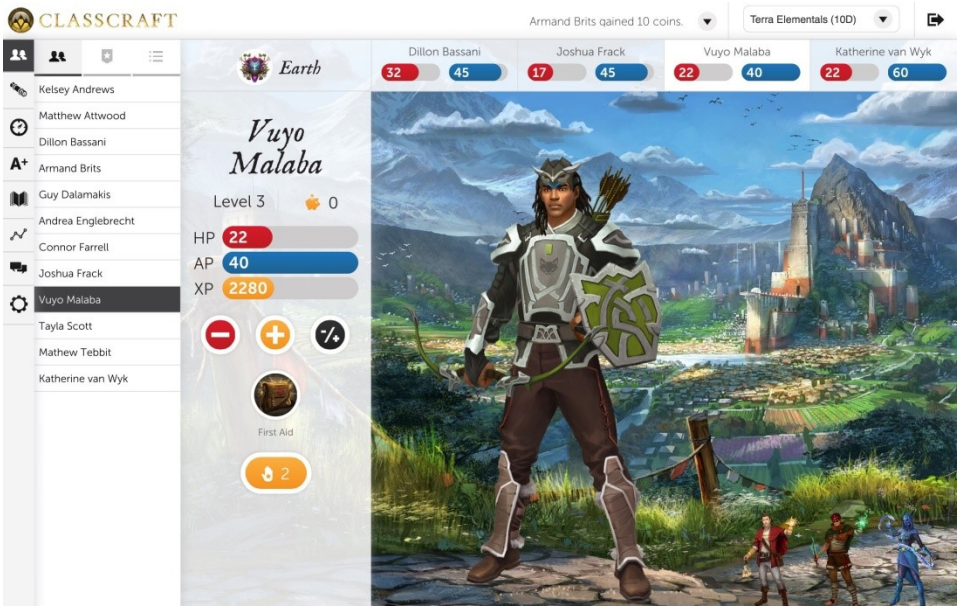
This study was based on the work done by Karl Kapp, a professional in the field of games and gamification. I focused on the elements of gamification he suggested in his book entitled: "*The Gamification of Learning and Instruction Fieldbook: Ideas into Practice*". These elements are:

- ✓ Collaboration
- ✓ Failure and replayability

- ✓ Competition
- ✓ Feedback
- ✓ Points and leaderboard
- ✓ Challenges

The main study platform

Classcraft is an online educational role-playing game that teachers and students play together in the classroom or during tutorial classes. It is not meant to replace the existing school curriculum but rather supplement classroom learning by encouraging teamwork and increasing student motivation and engagement. It was chosen because it has the potential of offering students the chance to experience gamification elements mentioned above.



A screenshot of Classcraft website

How Classcraft works

Classcraft helps foster performance and appropriate behavior in the classroom via a system of rewards and punishments set by the teacher or the school. For instance, students are expected to arrive on time and to participate in class. They are also encouraged to help their classmates and to collaborate during learning activities.

Classcraft is not meant to be used in a specific school subject, and using the platform can last from a few hours to an entire year, depending on the instructor's expectations and objectives.

In *Classcraft*, the players choose their teams of three to six members and then select their favorite character: a Mage, a Warrior or a Healer. Mages have the most advanced powers which are often beneficial for the whole team, but their lives are always vulnerable as they have very few Health Points (HP). Warriors have the most HP among all three characters and own powers which can be used to protect the other team members from dying in the game. Healers, on the other hand, have average HP, but they enjoy powers which can refill other players' HP. Therefore, students seek, throughout the game, to gain these powers which are beneficial for themselves and their team members. These powers can be game-based powers, such as protecting or healing other players or real-life rewards, such as having a snack in class, listening to music in class or having extra time to hand in an assignment. The teacher can customize these powers so that they match his/her students and classroom settings.

To acquire powers, the teacher (the Gamemaster) rewards positive behaviors as well as academic performance with Experience Points (XP) which

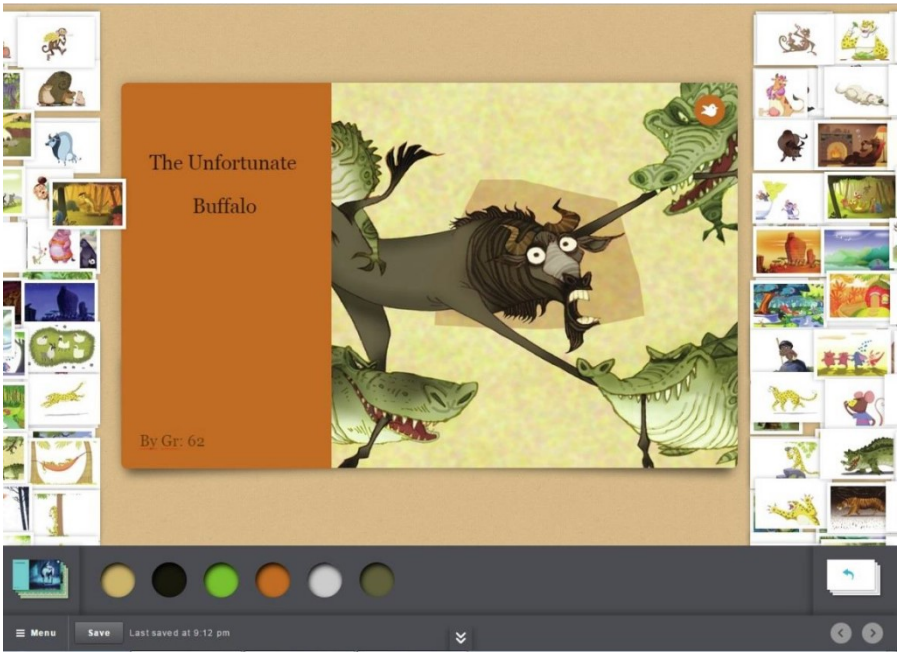
enable the players to gain powers and Gold Pieces (GP), customize their avatars and level up. Nevertheless, players would see their HP removed in case they exhibit inappropriate behavior, such as not being on time or not completing an assignment. When a player loses his/her entire HP, the other team members lose a certain amount of HP too, and he/she receives a real-life sentence, such as a detention or an hour of community service at school.

At the beginning of every class, the teacher (the Gamemaster) generates a random event which affects the entire class including the teacher. Examples of random event effects include positive and negative news, powers and sentences. The teacher can customize these events to adapt the platform to the curriculum objectives.

Classcraft is a web application which can be projected in front of the classroom using a smartboard or a simple screen projector. The players can also connect to the platform using their smartphones and tablets (the app is available for both Android and iOS).

Other online platforms

Storybird. This platform offers the possibility of creating picture books, stories and more through user-friendly steps. It actually helps students to create, collaborate and share their stories with other users. The story completion task was carried out using *Storybird*.

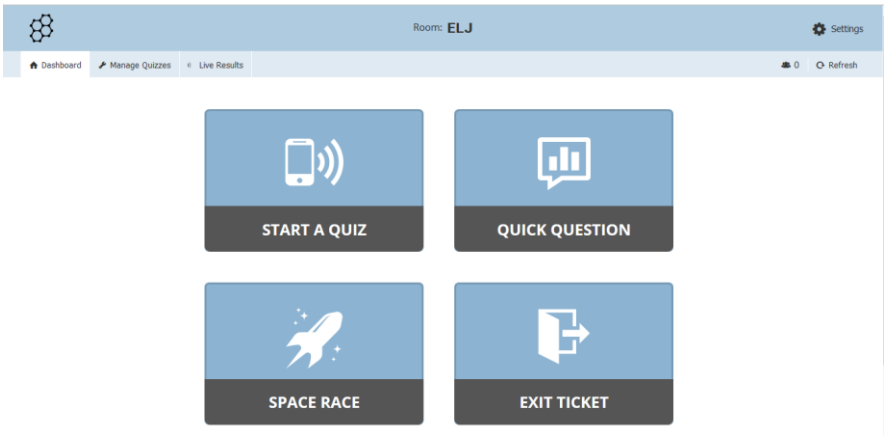


Storybird sample picture book

Voki. *Voki* is a unique website in the sense that it encourages participants to produce projects, interviews and stories using customizable avatars. It also allows users to add their own voice in an interactive way via microphone or text to speech add-on. All role-plays tasks were conducted using *Voki*.

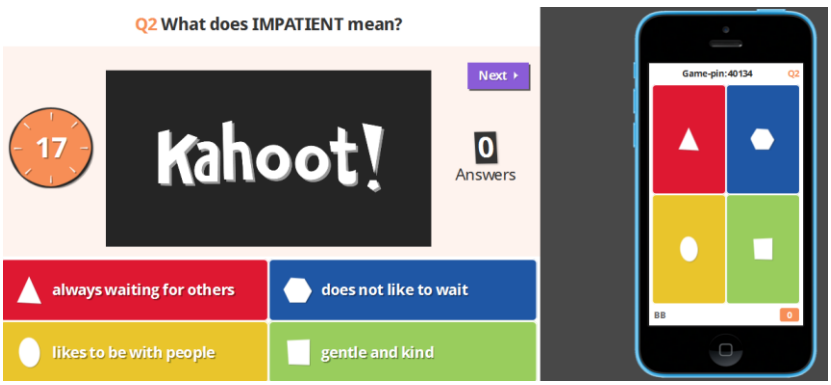
A screenshot of Voki home page

Socrative. This platform was used to help students practice certain grammar and vocabulary points already taught in the classroom. Through quizzes, *Socrative* allowed students to assess their knowledge on different topics while getting instant feedback. The matching task was done via *Socrative*.



A screenshot of Socrative platform

Kahoot. *Kahoot* is a collection of questions on any particular topic. Besides being created by teachers or students, questions are asked in real-time, to an unlimited number of users, generating a social and a game-like learning environment. Each question can be associated to a picture or a video, and to multiple choice answers. The trivia game was played using *Kahoot*.



A screenshot of Kahoot platform

Procedures

Upon receipt of The Concordia University Certification of Ethical Acceptability (Appendix A) and The approval of The Rive-Nord High School principal (the researcher got an oral permission to carry out the research study at school), an oral presentation of the research project was given to students in a remedial class during the last week of October. Students who were willing to take part of the research project and their parents signed informed consent and assent letters (Appendix B and C).

As a first step, the researcher checked the participants' tutorial schedule and then set up the study sessions accordingly, so that scheduling conflicts can be minimized as far as possible.

To help participating students be familiar with the study platform, the researcher devoted the first week of November to give them a 45 minutes tutorial on the main functionalities of *Classcraft* using a *Prezi* presentation and a couple of video capsules available on *Classcraft* website. Following the tutorial, participants were allowed the rest of the class (30 minutes) to select their team members, choose their characters and to personalize the name, look and logo of their teams. At the end of the class, all participants were asked to complete a pre-experiment questionnaire.

During the second week of November, participants had two remedial classes. One was dedicated to the role-play task, where students were asked to select and justify the use of survival items in the form of an oral presentation using *Voki*. In the second class, participants carried out the *quest for vocabularies* task in groups using instant messaging in *Classcraft*.

The following week, participants spent two remedial classes doing the *story completion* task individually using *Storybird*. Those who could not finish it during the allocated time had the possibility of doing it as homework.

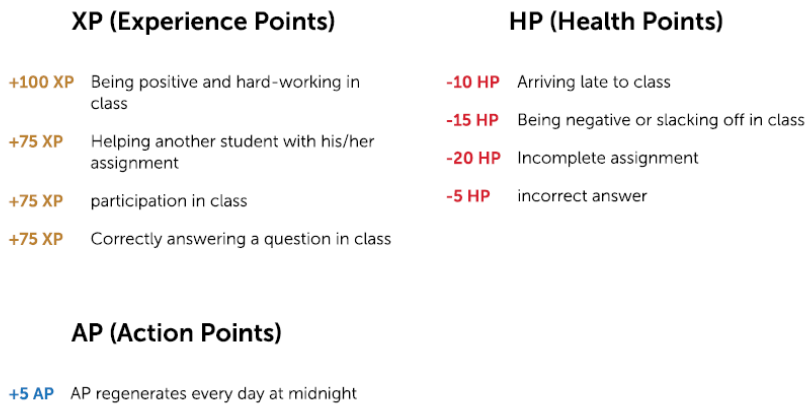
In the last week of November, students completed the *guessing* game and the *matching* task. The *guessing* game was a group task while the *matching* task was an individual activity carried out online via *Socrative*.

The last class took place during the first week of December. Participants were presented by a text about Salmonella to read during their regular class. To test their understanding of the text, they were asked to play a *trivia game* on *Kahoot* in groups using their gadgets.

Following the last class, participants were asked to complete a post-experiment questionnaire. Throughout the study project, the researcher jotted down detailed field notes which focused on participants' actions, their attitudes and the general atmosphere of the intervention.

Classcraft Rules, Powers and Sentences

The following snapshots summarize Classcraft rules, powers and sentences.



Screenshot of Classcraft Rules for behavior

Mage

COLLABORATIVE

Mana Transfer -35 AP
All team members, except mages, gain 7 AP.

Teleport -35 AP
The mage can trade grade with another team member

Invisibility -25 AP
The mage can come late to the lab

Mana Shield
The mage prevents the loss of HP to himself (costs 3 AP per 1 HP).

Cheat Death -15 AP
A fallen teammate (other than the mage) can reroll the cursed die but must accept the new outcome.

Time Warp -35 AP
The mage gains an extra 8 minutes to beat an exam.

Fountain of Mana -40 AP
A teammate, who isn't a mage, replenishes all of his/her AP.

Clairvoyance -40 AP
All of the team members get a hint on an exam question.

Warrior

COLLABORATIVE

Protect 1 -10 AP
The warrior can take up to 10 damage instead of his/her teammate, receiving only 80% of the initial damage.

First Aid -10 AP
The warrior gains 1 HP for each level they have, but always gains at least 5 HP.

Hunting -25 AP
The warrior can cause damage to the other team (lose 5 HP for all team members.

Protect 2 -15 AP
The warrior can take up to 20 damage instead of his/her teammate, receiving only 65% of the initial damage.

Ambush -20 AP
The warrior can hand in an assignment next class.

Counter Attack -20 AP
The warrior gets a hint on an exam question.

Protect 3 -20 AP
The warrior can take up to 30 damage instead of his/her teammate, receiving only 50% of the initial damage.

Healer

COLLABORATIVE

Heal 1 -15 AP
A teammate gains 10 HP.

Sainthood -25 AP
The healer can transfer 50 XP from any player from the other team.

Ardent Faith -10 AP
During an exam, the healer can ask the Gamemaster if his/her answer to a question is correct.

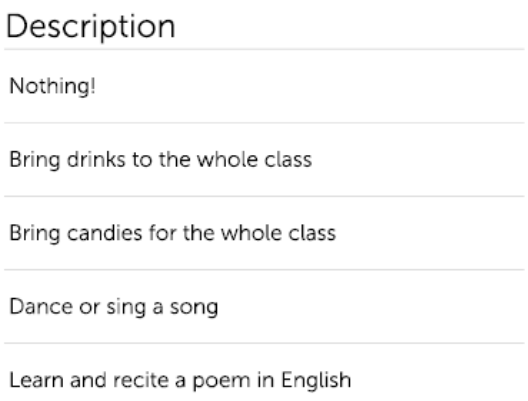
Heal 2 -20 AP
A teammate gains 20 HP.

Favor of the Gods -35 AP
The healer can have a free snack next class.

Revive -25 AP
When a teammate (not including the healer) falls to 0 HP, he/she avoids all penalties and comes back to life with 1 HP.

Heal 3 -20 AP
A teammate gains 30 HP.

Screenshot of Classcraft Rules for powers



Screenshot of Classcraft consequences

How Data Was Collected

This section explains the different methods which were considered for collecting both quantitative and qualitative data.

Questionnaires. For quantitative data, participants filled out a questionnaire of 11 questions before the intervention took place to indicate their general attitudes and motivation towards regular English activities and current teaching methods (Appendix D). They were also asked to indicate their perceptions of competition in learning, teamwork and working on English assignments and projects online. Then, they were invited to reveal their degree of interest in games and whether or not playing games can help them learn English better. Finally, the last two questions inquired about participants' assessment of the importance of rewards and winning both in school and games.

The post-experiment questionnaire (Appendix E), which featured 13 questions, assessed the participants' experience with *Classcraft* and the other online platforms. It included questions about how challenging and meaningful the content of the activities was, the fun aspects which were enjoyed the most and the

gamification elements which appealed to the participants. The last two questions asked the surveyees to evaluate their level of motivation after the intervention and whether or not they recommend using *Classcraft* in their regular English class.

Both pre-experiment and post-experiment questionnaires consisted of closed-ended questions. They were developed by the researcher, who solicited feedback from his supervisor and from other English teachers in regards to their potentials to effectively assess students' attitudes towards gamification design elements. Table 2 summarizes the relationship between pre and post-experiment questionnaires items and the research questions.

Table 2.Relationship between pre and post-experiment questionnaires items and research questions

Type of questionnaire	Research question	Items in questionnaire
Pre-experiment	1	1-2-3-4
	2	5-6-7-8-9-10-11
Post-experiment	1	1-2-3-4-5-6-7-8-9-13-14
	2	10-11-12

Focus group interview. The researcher chose focus group interview over the other types of interviews because of its potential to yield the best information when the interviewees are interacting with one another, especially when they are cooperative with each other (Creswell, 2012). Therefore, the researcher recognized that it was highly crucial to the quality of the study to conduct the interview in French to help the participants give meaningful and deep accounts of their experience of gamification. First, the interview was scheduled right after the end of the intervention in the school lab, and it lasted for approximately 60 minutes. The eleven questions (Appendix F) were designed to determine the nature of experience the participants had with the gamified environment. They elicited information about the kind of feelings they experienced throughout using *Classcraft* and the other online platforms, and the gameful aspects that were motivating and challenging in the intervention. The participants were asked to comment on the significance of rewards, such as scores, levels and achievements in maintaining their motivation, and to evaluate *Classcraft* in terms of fun and effectiveness. Finally, they were invited to make a quick comparison between their English regular class and the gameful intervention, and to suggest amendments to make *Classcraft* better. The researcher was careful not to impose any thoughts during the interview; however, he encouraged elaboration where necessary to elicit deeper responses that would help construct the research theory.

Observation. The advantage of using observations is that it allows the researcher to record information as it occurs in a setting and to study actual behavior (Creswell, 2012). The observation notes focused on how the participants reacted to the activities, how motivated they were while using the gamified platform and how gamified elements fit in. The researcher made detailed notes of

the interaction between participants, their emotions, reactions and atmosphere of the learning environment.

Data Analysis

Quantitative Data Analysis

To facilitate the analysis of the collected data, SPSS (Statistical Package for the Social Science) was used. The researcher assigned numeric values to each survey response. Table 3 summarizes the values and the response options for each question in both pre and post-experiment questionnaires.

Descriptive statistics were used to examine the collected data from closed questions. The main goal of this quantitative method is to explain how scores might be varied and to provide an understanding of how one score stands compared to others (Creswell, 2012). Corbin and Strauss (2008) claimed that grounded theory methods encourage the use of both qualitative and quantitative data because they can work together to develop theory.

Results of the questionnaires are explained in the following chapter as they reveal additional information on participants' experience with gamification contributing to the emergence of the grounded theory of the present study.

To maintain a strict confidentiality throughout the study, each participant was assigned a pseudonym instead of his/her real name on the pre-experiment and the post-experiment questionnaires as well as the focus group interview.

Assuring Reliability and Validity

To ensure trustworthiness of the findings, Creswell (2012) suggests using at least two of the following criteria:

- ✓ Peer review or debriefing the findings with a colleague;
- ✓ Negative case analysis where initial patterns of data are revisited in case contradictory patterns are found;
- ✓ Member checking the findings with participants to ensure credibility;
- ✓ Triangulation or using various sources of data, methods and theories;
- ✓ Prolonged engagement in the field and persistent observation of the participants;
- ✓ Clarifying researcher bias;
- ✓ Rich and thick description of quotes that provide the reader with the ability to make judgments;
- ✓ External audits that involve an independent person evaluating the accuracy of the findings;

The current study used several procedures to ensure trustworthy findings. First, Triangulation of various analyses was utilized. Both quantitative and qualitative methods were included in this thesis to help with comparative analysis. Additionally, the participants provided the researcher with rich and thick quotes during the focus group interview. These quotes yielded deep insights about participants' experiences with gameful learning, which enhanced the credibility of the study findings. Lastly, the study results were reviewed with a PhD candidate,

who is also a researcher with deep expertise in quantitative analysis and pertinent background knowledge in the field of education.

Table 3.Values and response options for pre and post-experiment questionnaires items

Pre-experiment questionnaire		Post-experiment questionnaire	
Items	Values	Items	Values
1-2-3-4-5-6-9-10-11	5: Strongly agree 4: Agree 3: Disagree 2: Strongly disagree 1: Don't know	1-2-6-7-8-9-14	5: Strongly agree 4: Agree 3: Disagree 2: Strongly disagree 1: Don't know
7	1: Yes 2: No	3-4	5: Excellent 4: Good 3: Fair
8	5: More than a year 4: 6 months 3: More than a month 2: Less than a month 1: Never		2: Bad 1: Don't know
		5	4: Voki 3: Storybird 2: Kahoot 1: Socrative
		10	3: Overcome a challenge 2: Enjoy doing the activity 1: Interaction with others
		11	5: Rules 4: Leaderboard 3: Avatars 2: Levels 1: Rewards
		12	4: Challenges 3: Freedom to fail 2: Feedback 1: Points
			5: A lot 4: Average

	13	3: A little 2: Not at all 1: Don't Know

Qualitative Data Analysis

A constructivist grounded theory approach was judged appropriate for the data analysis as it allows for the construction of a theory that is inductively derived from the phenomenon it represents (Strauss & Corbin, 1990).

Following the grounded theory approach, the interview was translated into French and then transcribed two days after completing the interview. While being a time-consuming step, this step was crucial to unify the language in the verbatim. The researcher then shared the verbatim with the participants for validation. The process of listening to and transcribing the audio recording of the interview allowed the researcher to immerse himself in the data from an early phase of the analysis. Analysis of the transcripts consisted of several staged processes, as outlined by Charmaz (2006), including initial, focused and theoretical coding, a constant comparative method and theoretical sampling. All the data coding was carried out with the help of MAXQDA 12 software.

Coding

Coding is the first step in analysis, and it refers to the clustering of data into labeled segments, which marks the process of moving from tangible statements in data to analytic interpretations (Charmaz, 2006). For a grounded theory, coding starts the process of selecting, separating and classifying data into an analytic record. It also builds the framework for examining actions, processes and incidents, towards the development of a theory.

Initial coding

Initial coding helps identify points of view, incidents, actions and categories (Charmaz, 2006). During this stage, data were coded, line by line, into actions and incidents with a label summarizing the content. This initial phase of analysis was exhaustive and time consuming as it explored the meaning and the language use in a detailed manner. However, this process ensured a considerable familiarity with the transcripts, which led to the identification of specific perspectives which reflected the participants' attitudes towards the concept of gamification. At this level, the researcher put concepts and themes that share the same properties together, and he ordered and refined codes until saturation.

Focused coding

The next step of coding was to apply focused coding. Focused coding requires taking decisions about initial codes which make most analytic sense (Charmaz, 2006). Through line-by-line coding, the researcher used the most frequently occurring and significant codes and subcategories from the data to label and synthesize larger clusters of data to form categories. He also kept going back to initial coding as focused coding does not necessarily happen linearly. While developing these categories, data and codes were compared with each other as well as other data sources from the same participants.

Theoretical coding

Theoretical coding identifies the relationships between categories generated during focused coding (Charmaz, 2006). It is also seen as more open compared to other coding methods in other grounded theory schools as coding families or

conceptual guides can be used to explain and enhance the analysis (Charmaz, 2006). At this level, the researcher started to conceptualize relationships between the categories generated during focused coding. Examples of relationships included attitudes, causes, consequences and contexts.

Theoretical sampling

While theoretical coding helps specify the relations among categories, theoretical sampling aids at refining key categories in the study. It allows the researcher to elaborate the meaning of the categories, discover variation within them and to define gaps among categories (Charmaz, 2006). Following the grounded theory approach, these categories should be analyzed and assessed until "saturation" where new data reveal no new insights or properties of the core theoretical categories (Charmaz, 2006). As theoretical categories started to take shape, the researcher was guided by his memos and written reflections to compare data with each other, and thus discover gaps among categories and find ways to fill them. This process of theoretical sampling was repeated over a period of a week until the researcher felt he saturated most categories and their interrelations.

Memo writing

According to Charmaz (2006), memos are an informal method of analyzing codes. They may include notes about: comparisons between data and codes, data and data, codes and codes, codes and categories, categories and categories, identified gaps and details about processes. Memos help researchers address patterns in their data, which is considered a crucial component of theory development (Charmaz, 2006). With this being said, the researcher used memos throughout the data analysis to raise codes to the stage of conceptual categories.

Then, these memos were linked, organized and paired with theoretical categories to generate the study theory.

Ensuring Trustworthiness

Charmaz (2006) identifies various criteria to assess the quality of a grounded theory research study. Among these criteria, the researcher paid a considerable attention to credibility, originality, resonance and usefulness.

Credibility

For Charmaz (2006), a credible study may involve one or several of the following criteria: an intimate familiarity with the setting or topic, sufficient data to merit the claim, systematic comparisons between observations and between categories, data with a wide range of empirical observations, logical links between the gathered data and the arguments and enough evidence for the claim to allow the reader to form an independent assessment.

Throughout this thesis, credibility was addressed in a number of ways. First, while collecting data, the researcher had to deal with a crucial issue in case respondents might have provided him with perspectives different from their real practices to please him. To prevent this problem, the researcher encouraged and valued the participants' efforts and kept reminding them that the success of the study depends on their real and authentic experiences. Moreover, the participants and their parents were assured throughout the data collection process that their participation was confidential and that their real names were substituted by pseudonyms. They were also advised that the collected data are only accessed by the researcher, his supervisor and a trusted colleague.

The strategies used for the data collection, coding and analysis were amply described, providing an evident account of how the theory was constructed. The readers are therefore able to examine if systematic comparisons between observations and between categories were made and if these categories covered a wide range of empirical observations.

Member checking was another instrument to ensure the credibility of the collected data. Member checking refers to "the process in which the researcher asks one or more participants in the study to check the accuracy of the account" (Creswell, 2012). During every phase of the data collection, the continuous collaboration with the participants allowed the researcher to solicit their views of the credibility of the findings as well as the validity of the interpretations.

Originality

Originality refers to how a grounded theory refines, challenges, or extends existing ideas and concepts in a given area of research (Charmaz (2006). Although the literature suggests that the use of game mechanics increases user engagement, studies are scarce about its use in high school and even inexistent in ESL (English as a Second Language) learning context where several hindrances exist such as anxiety, low academic achievement and traditional teaching methodologies. With this in mind, the present study suggests a novel conceptual framework whereby ESL learners can take advantage of certain gamified elements to enhance their classroom motivation.

Resonance

Resonance refers to the extent to which a grounded theory reflects the lived experiences of the participants and offers them deeper insights about their lives and worlds (Charmaz, 2006). During the focus group interview, the researcher prompted the participants to talk about their experiences with the gamified tools. By recapping on key terms and processes, important categories that portray the studied experiences emerged during analysis.

Usefulness

Usefulness refers to what extent a grounded theory offers interpretations that people can use in their everyday lives (Charmaz, 2006). The current thesis reveals findings about key elements of gamification that can revolutionize ESL teaching. The researcher perceives that all teachers or professionals working with young learners can draw upon this study analysis and recommendations in order to enhance students' motivation and engagement.

Chapter 4 -- Results

This chapter presents both the results of the quantitative and the qualitative analyses in an effort to answer the research questions. First, the statistical analysis of the quantitative component is explained and then the major findings from the focus group conducted with the participants together with the lab observation are described and analyzed. The chapter concludes with a visual representation (*Figure 4*) of the constructed grounded theory which demonstrates a more detailed understanding of the process of engaging and motivating ESL learners with gamification.

Quantitative Results

The main findings of pre and post-experiment questionnaires were analyzed according to the research questions.

Quantitative results related to research question 1:

What impact does using gamified learning materials have on students' motivation?

Prior to the intervention, all respondents (37,5% strongly agreed and 62,5% agreed) indicated that they enjoyed taking English courses; however only 2 respondents (25%) agreed that they learn better with student books and teacher worksheets, while 4 others (50%) denied this. Overall, all respondents (75% strongly agreed and 25% agreed) emphasized the fact that activities should be interesting to help students learn better. In terms of their learning attitudes, all respondents (50% strongly agreed and 50% agreed) claimed the importance of online assignments or projects in enhancing their skills in English.

To assess students' experience and attitudes towards the gamified intervention, the post-experiment questionnaire revealed that all respondents (87,5% strongly agreed and 12,5% agreed) enjoyed using *Classcraft*. They (62,5% strongly agreed and 37,5% agreed), also, agreed that using *Classcraft* and the other online platforms was rewarding to their learning experience. Although 1 respondent (12,5%) was not sure about what to answer, the majority (87,5%) considered the content of the activities to be meaningful and challenging.

To elicit the respondents' level of motivation towards using gamified learning, results indicated that the majority of respondents (87,5% strongly agreed and 12,5% agreed) wish to use *Classcraft* in their English class. Likewise, while 2 respondents (25%) claimed to have an average motivation to learn English, the rest of the respondents (75%) indicated being highly motivated to study English. Table 4 provides a comprehensive summary of the responses to items related to research question 1.

Table 4. Summary of responses to items related to research question 1

Type of questionnaire	Item	Item Content	Responses	n	%
Pre-experiment	1	I enjoy taking English courses	Strongly agree	3	37,5
			Agree	5	62,5
			Disagree	0	0
			Strongly disagree	0	0
			Don't know	0	0
	2	I learn better with my student book and the teacher's worksheets	Strongly agree	0	0
			Agree	2	25
			Disagree	3	37,5
			Strongly disagree	1	12,5
			Don't know	2	25
	3	If the activity is interesting, I learn better	Strongly agree	3	37,5
			Agree	5	62,5
			Disagree	0	0
			Strongly disagree	0	0
			Don't know	0	0
	4	Working on assignments or projects online helps me to be good in English	Strongly agree	4	50
			Agree	4	50
			Disagree	0	0
			Strongly disagree	0	0
			Don't know	0	0

Type of questionnaire	Item	Item Content	Responses	n	%
Post-experiment	1	I had fun using *Classcraft*	Strongly agree	7	87,5
			Agree	1	12,5
			Disagree	0	0
			Strongly disagree	0	0
			Don't know	0	0
	3	How would you rate your experience with *Classcraft*	Excellent	7	87,5
			Good	1	12,5
			Fair	0	0
			Bad	0	0
			Don't know	0	0
	6	I learnt better with *Classcraft* and the other online platforms	Strongly agree	3	37,5
			Agree	5	62,5
			Disagree	0	0
			Strongly disagree	0	0
			Don't know	0	0
	7	The content of the activities was meaningful	Strongly agree	2	25
			Agree	5	62,5
			Disagree	0	0
			Strongly disagree	0	0
			Don't know	1	12,5
	8	The tasks were challenging	Strongly agree	3	37,5
			Agree	4	50
			Disagree	0	0
			Strongly disagree	0	0
			Don't know	1	12,5
	13	How motivated are you to learn English	A lot	6	75
			Average	2	25
			A little	0	0
			Not at all	0	0
			Don't know	0	0
	14	I wish I can use *Classcraft* in my regular English class	Strongly agree	7	87,5
			Agree	1	12,5
			Disagree	0	0
			Strongly disagree	0	0
			Don't know	0	0

Quantitative results related to research question 2:

What gamification elements would motivate and engage ESL learners?

Because the respondents confessed having quite a long experience in gaming (more than a year), they were asked before the intervention took place to share their thoughts about certain game elements. In terms of competition and cooperation, results revealed that 6 respondents (75%) had a tendency to compete themselves against their peers as a way to evaluate their learning abilities and 7 respondents (87,5%) considered cooperation to be an essential factor in performing better in their English class. Moreover, the majority of the respondents (37,5% strongly agreed and 37,5% agreed) indicated that winning is important in both school and games. Aside from winning, the study results showed that all participants (50% strongly agreed and 50% agreed) like to receive rewards when doing well at school.

When asked about the game elements they enjoyed the most after using either *Classcraft* or the other online platforms, the study results revealed an evident tendency towards overcoming a challenge (75%), then interacting with others (12,5%) and enjoying doing activities (12,5%). As for game mechanics, challenges was the most selected by half of the respondents (50%), followed by avatars and rewards (37,5% each), a further 25% ticked freedom to fail and points (25% each); the least appealing game elements were leaderboard and rules (12,5% each). Table 5 provides a comprehensive summary of the responses to items related to research question 2.

Table 5. Summary of responses to items related to research question 2

Type of questionnaire	Item	Item Content	Responses	n	%
Pre-experiment	5	I like to compete myself to my colleagues to see how good I am in English	Strongly agree	3	37,5
			Agree	3	37,5
			Disagree	1	12,5
			Strongly disagree	0	0
			Don't know	1	12,5
	6	I perform better when I work in teams rather than when I am working alone	Strongly agree	4	50
			Agree	3	37,5
			Disagree	0	0
			Strongly disagree	0	0
			Don't know	1	12,5
	10	I feel that winning is important in both school and games	Strongly agree	3	37,5
			Agree	3	37,5
			Disagree	0	0
			Strongly disagree	0	0
			Don't know	2	25
	11	I like to get rewards when I do well in my class	Strongly agree	4	50
			Agree	4	50
			Disagree	0	0
			Strongly disagree	0	0
			Don't know	0	0

Type of questionnaire	Item	Item Content	Responses	n	%
Post-experiment	10	What fun aspect you enjoyed the most	Interaction with others	1	12,5
			Enjoy doing the activity	1	12,5
			Overcome a challenge	6	75
	11	What element you have enjoyed in *Classcraft*	Rewards	3	37,5
			Levels	0	0
			Avatars	3	37,5
			Leaderboard	1	12,5
			Rules	1	12,5
	12	What element you have enjoyed in the online platforms	Points	2	25
			Feedback	0	0
			Freedom to fail	2	25
			Challenges	4	50

Qualitative Results

The overall objective of this grounded theory study is to develop a deep understanding of how participants interacted with gameful learning elements and ultimately to generate a relevant theory on how to use gamification to enhance students' motivation and engagement, which could inform policy and practice in the field of education. In this section, I described the core categories and the subcategories that emerged directly from participants' answers in the focus group interview

Limitations of Current Teaching Strategies

Taking an overview, all participants reported their excitement about using technology as a learning tool, pointing out that motivation and engagement towards learning comes from the perception of the added values innovative teaching strategies are able to put forward. William stated that *"learning English and helping the future generations motivated me to do activities. Compared to old generations, we have the new technology that we can use to advance".* Nancy defined the key element to a better learning to be *"fun"*, she explained that *"When the concept was explained the first time, it was so interesting, later on, it was really fun"*. On the other hand, talking about the utility of technology in shaping the strategies of teaching sheds light on some limitations of both conventional teaching methods and some recently developed teaching platforms.

Conventional Teaching Limitations

All participants agreed that the content of the learning activities and assignments should be interesting to motivate and engage students. In this context, John highlighted that the conventional English class does not prepare him

to be a competent user of English because the activities are monotonous, indicating that there is no room for creativity because students are doing the same thing; he said *"in class, it's a kind of boring. Everybody is doing the same thing"*. Likewise, Nancy and Tom stated that what makes the learning content sound boring is the fact that students are obliged to do it. She pointed out that conventional teaching methods do not fulfill the socio-affective requirement of the students, which makes them more curriculum-centered than learner centered. Nancy said *"they give us activities not to entertain us but because they are obliged to do it. For Classcraft, we are not obliged to do it, so it is fun…. We are free to do it, not obliged to…".* Similarly, Tom said *"In Classcraft, we have the impression that we are in real life, and we can progress better, while in regular class we have the impression that we are obliged to do it"*. Furthermore, according to William and Tom, among the most crucial factors that could transform a monotonous class into a challenging and a motivating one is group work or teamwork. William mentioned that instead of being considered as a contribution to student learning, group work is considered as a nuisance to learning. He said *"we do not have the privilege to work in groups in a regular class all the time because teachers think that we will be influenced in a negative way"*. In the same context, Tom said *"in class, we are not usually working in teams where we play or work together"*. John saw this as a barrier to fostering a social environment where students can learn through interaction; *"in a regular class, it is often an individual work without the possibility of talking, kind of antisocial".* The first day the participants used and interacted with *Classcraft*, the researcher observed that participants' interest increased significantly. That interest was maintained throughout the period of the intervention thanks to group work.

Online Teaching Platforms Limitations

All respondents claimed *Storybird* to be the weak link among the suggested online platforms. Participants outlined several features that do not qualify *Storybird* to bear a user-friendly label. First, the platform suggests a bunch of pictures which are supposed to help users construct their picture books, but because the number of pictures proposed for each theme does not exceed 20 to 30 pictures, the participants found it hard to create their stories with that amount of visuals. In this context, John said *"what I didn't like about Storybird is that we didn't have enough pictures".* He also added that the suggested pictures were not interesting, which had a negative influence on the participants' motivation. As the researcher realized while observing the participants' attitudes towards *Storybird*, only 3 out of 8 students could finish their stories and the others spent a considerable amount of time trying to adapt their ideas to the given pictures; there were 3 students who were even obliged to restart their stories twice and even three times due to lack of ideas which would match the pictures they chose. John stated *"the pictures provided in the platform are boring. It was hard to create a story with those pictures. To put them together was a kind of ... eternity".* As 5 participants could not finish their stories in due time, they were asked to do it as a homework, but no one did it because Andrew mentioned *"I could not finish it home because I couldn't do it ..."* and William said *"it's just Storybird that I didn't like because it demands a lot of creativity".*

Importance of Gamification in Education

The focus group interview revealed that the participants were eager to try *Classcraft* because of the similarities gamification shares with games. Although different types of games are used widely by ESL teachers such as card games and

board games to enhance motivation and increase communication, the researcher realized a vibrant enthusiasm from the part of the participants when they used *Classcraft*, mainly because it was perceived more as a videogame than a regular classroom game as Andrew mentioned *"I like Classcraft because it looks like a videogame"* and because it was seen as an appealing alternative to traditional assignments, which helped the participants to focus their attention and to be actively immersed in the given activities; Andrew said *"Classcraft is more like a game not like a homework or an assignment".*

Gamification Enhances Learning

Field observation clearly indicated that a gamified environment fosters learning in many ways. Participants were seen interacting with the gamified platform in a playful mood and trying new things safely. Nancy saw the benefit of gamification in the joyful atmosphere where participants were having fun and excited to learn because they were entertained, she said *"I feel more motivated to learn English because it's entertaining"*. Likewise, George was clearer in his comment when he mentioned that gamification helped him make his learning experience much more effective. Contrary to a regular class where he has to deal with a dull content, a gamified environment allowed George to enjoy the learning process and to actively participate while having fun; he said *"I learnt better with gamification instead of listening to the teacher in a classical way"*. On the other hand, Tom raised an interesting point when he pointed out that *gamification* helped him to satisfy his need for self-esteem and to reinforce it with peer recognition as participants could see and share their scores and rewards with their partners, he said *"I feel I can learn better with such games because I want to display who I am and I want to enrich my team's score".*

Gamification Develops Skills and Capacities

All participants claimed that gamification provided them with the opportunity to develop several skills and capacities, which include speaking skills, reading skills (vocabulary acquisition) and cognitive skills (memory and decision-taking). As the researcher noted, the gamified activities created a rich environment that encouraged communication and feedback, not only between the teacher and the students, but between the students as well. This dynamic approach aided the participants to communicate in English freely and safely. In this context, Timothy said *"Classcraft helped us to speak in English"*. When asked about which skills gamification helped him develop, Andrew said *"speaking"*. Not only did the participants enjoy the activities associated with gamification, they also enhanced their knowledge of familiar words and developed a significant understanding of new vocabularies. Through a word game, where the participants had to find words that start with the assigned letter for each lexical category, the participants came across a bunch of words they were not familiar with. What was amazing about this practice is that the participants kept repeating those newly-acquired vocabularies for some time during the intervention either for their "weird" pronunciation or for their close similarity with French. In this context, Nancy said *"I had to find words that start with the given letter. That helped me learn a lot of words that I didn't know they existed. That was fun"*. Similarly, Leo mentioned that he could learn new vocabularies thanks to the gamified activity, where he had to struggle and focus to come up with suitable answers, he said *"what was challenging about the activity is to look for words that start with the given letters. That helped me learn new words". Gamification* had also a positive impact on the participants' cognitive skills, mainly memory and decision-taking.

The researcher used *Kahoot* to evaluate students' understanding in regards to a text about Salmonella. The gamified platform showed the participants pictures of international flags over and over, with labels attached. Then they were given quizzes where they had to identify each country's flag and to answer some comprehension questions. The participants claimed that this gamified activity helped them to perform tasks efficiently as their mind was stimulated. In this context, William said *"we didn't just work in English, but memory too such as flags of countries where we were asked to use our memory to answer the questions. Now we're going to remember the flags thanks to that activity"*. Nancy also said *"what was challenging about the activity was memory. You have to dig deeper in your head as in Kahoot to find the right answer"*.

Gamification Elements Design

The participants seemed to fully appreciate the game mechanics and dynamics embedded in *Classcraft*. Among the game mechanics that drew the participants' attention, there was leaderboard, rewards and avatars. Actually, Timothy highlighted the fact that the use of avatars combined with points had a positive impact on his motivation; he stated *"the fact that we had an avatar that we can personalize with points and golden pieces that we gained throughout the game motivated us too"*. Challenges, cooperation, competition, fun, peer social interaction and autonomy of learning were the main game dynamics the participants enjoyed during the study intervention. John's statement summarizes the positive contributions of game dynamics when he said *"personally, I liked the group challenges as if we were gaming for real. It's fun when we play a group against the other instead of one against the other. This is what I liked the most"*. Nevertheless, the gamified intervention engendered a new *gamification* element

that contributed positively into students' motivation and engagement. This element is: creating new experiences.

Game Mechanics

Leaderboard

The researcher noticed that having *Classcraft* leaderboard visible each lab class was an effective way to generate a healthy competitive excitement and incredibly keen impulses to play as well. The leaderboard displayed all players' avatars along with their scores, levels, powers and pets. Tom pointed out that the gamified leaderboard allowed him and his classmates to check their individual and group progress over time either in the lab or at home, which he considered a practical method to measure achievement, he said *"an element that I liked about Classcraft was the leaderboard because we could check our progress and the progress of our avatars too"*. Timothy, on the other hand, saw the leaderboard not only as a way to visualize skill progression, but also as a mechanism to compare players and teams' scores and performances. This comparison, according to Timothy, created a powerful motivator for each team to do better to reach higher ranks; he said *"when we see that the others are ahead we do more to reach them"*. Similarly, Tom mentioned that the leaderboard had the potential to increase players' achievements as it enhances social interaction and discussion around the gamified platform. This interaction was described as a real-life experience, he said *"we can see our progress online or home. Everybody can check his/her progress. We talk about it. We have the impression that we are in real life, and we can progress better"*.

Avatars

The use of avatars has been acknowledged throughout the gamified intervention for its positive impact on students' motivation and engagement. The researcher noted how the participants used to come to the lab 10 minutes earlier to interact with their avatars. They were eager to change their "newbie" appearances whenever they had the necessary points to do so. They were also keen on getting new equipments and powers as they level up or get golden coins. In fact, Timothy indicated that having the opportunity to interact with the assigned content using avatars of their own choice provided him with the opportunity to engage with the learning activities, he said *"we could create our own avatars and progress with them in the game"*. Besides, Nancy, George and Leo appreciated the various personalization features *Classcraft* offered them. They all agreed that coming up with unique designs for their avatars that match their personal image and identity was one of the strengths of *Classcraft*; Nancy said *"activities were fun and interesting; points, too, because you can use them to personalize your avatar with them. You can put the avatar into your image"*; Leo added *"I feel motivated because I could personalize the avatar and do a lot of things with Classcraft, it is fun";* George also stated *"I liked it when we can personalize our avatars; we had all sorts of challenges"*. In addition, William highlighted the fact that an avatar-based environment allowed him to communicate with the teacher and his team mates in a flexible and creative way, he stated *"I liked the possibility to write and send messages in Classcraft using our avatars. It was easy to communicate with everybody and it was fun too"*.

Rewards

Classcraft provided the participants with instant rewards in the form of points, golden coins, powers, levels and pets. While observing the participants' interaction with *Classcraft*, the researcher remarked how rewards were genuinely effective in maximizing participants' efforts and concentration. They pushed their limits to get the assignments done accurately and they were kept focused on tasks knowing that there is a payoff for their efforts. In this context, Timothy thought of rewards as a motivating factor that recognize their efforts and achievements, he said *"the fact that we had an avatar that we can personalize with the points and golden pieces that we gained throughout the game motivated us too"*. Furthermore, Timothy, Tom and George enjoyed using points as a virtual currency to level up or to buy equipments and get additional powers. Like this, they were eager to contribute more to the success of their teams; Tom stated *"I liked it when there is an interaction between Classcraft and our points in the other activities to have an award or something like that"*; Timothy said *"I like it when we can do something with the points we gain to have rewards on Classcraft. We can use them to advance and buy equipments and powers"*; George said *"we can get points that we can use to get several things on Classcraft"*.

Game Dynamics

Having fun

The word "*fun*" was repeated frequently during the focus group interview. It was the key term the participants used to evaluate their overall experience with the gamified intervention. Nancy, for instance, took pleasure in exchanging comments about the scores with the other players while interacting with *Kahoot*,

she said *"I loved Kahoot because every time we see the score, we give a lot of comments. That was sort of funny to me"*. She also described her learning experience with the vocabulary game as fun, she stated *"when we had to find words to start with the given letter, that helped me learn a lot of words that I didn't know they existed. That was fun"*. Besides, all the participants were of the opinion that *Classcraft* was a fun addition to their learning experience. Andrew elaborated further stating that *Classcraft* allowed him to focus on his studying while having fun, he said *"Student Andrew: what helped me to focus was having the possibility to work while having fun"*. Leo together with Timothy and Nancy perceived the usefulness of *Classcraft* mostly in catching their interest and allowing them to live an amusing experience, Leo said *"I played games such as this one, it's fun and amusing"*; Timothy stated *"we were not bored doing it, we were pleased doing it"*, Nancy said *"when you explained the concept the first time, it was so interesting, later on, it was really fun"*. Finally, John saw communication and social interaction as one of the fun features of *Classcraft*, he stated *"we are having fun here. We can laugh and work. While in a regular class it's an individual work without the possibility of talking, kind of antisocial. It's better to be in the lab"*.

Competition

It was clear from the beginning of the gamified intervention that the competitive aspect of *Classcraft* provided the participants with the opportunity to engage with each other and to join their efforts to reach higher scores. To avoid the negative consequences of an unhealthy competition, the researcher divided students into smaller competitive teams. In this way, individual efforts were put together to increase the team's performance. In addition, the researcher made it

clear that winning or losing is not that important compared to learning and improving one's skills. George and Timothy indicated that playing one team against the other pushed the players to strive hard to devote their attention and focus to optimize their performance to finally get superior results; he said *"I adored playing against each other. We wanted to be the first, so there was a lot of competition"*, Timothy stated *"when we see that the others are ahead, we do more to reach them"*. Andrew, on the other hand, mentioned that the leaderboard was of a great use to the players as it allowed them to experience competition through live tracking, he said *"with the leaderboard, playing a group against another one created a lot of competition"*. In accordance with current research, John mentioned that group competition is more effective and fun than individual competition, he said *"it's fun when we play a group against the other instead of one against the other. This is what I liked the most"*.

Cooperation

The current study suggested activities that required the players to team up with others. Each player had to contribute to the team goal, and any points or levels achieved could be spent to get joint rewards. On his field notes, the researcher pointed out that the teamwork which took place during the gamified intervention had a positive impact on participants' performance. He noticed how advanced students worked as mentors to encourage less advanced students maximize their achievements and how the participants developed survival strategies not to lose health points. In this context, Leo, John and Tom stated that cooperative activities helped them to complete tasks that contributed to the progress of the team as a whole. This strategy holds the players more responsible for their individual actions; Tom said *"In class, we are not usually working in*

teams where we play or work together. In Classcraft, we are in teams, and we don't want to deceive the others", John further elaborated *"in class, it's kind of monotonous. Everybody is doing the same thing. In Classcraft, we are not doing the same thing,, and we can help each other do different stuff"*, Leo stated *"we could help each other, if someone would die, we could give him/her HP to survive"*. Moreover, Tom made it clear that contributing to the success of his team and being proud of both his achievement and the team's achievement as well was a factor that motivated him to do the assigned activities, he said *"what motivated me is to advance my group in the game. The progress bar allowed me to be proud of myself and my achievement and those of the other teams too"*.

Peer social interaction

Field observation revealed that the social interaction between the participants encouraged them to brush up on several social skills such as sharing, cooperation and communication. For example, Tom mentioned how communicating and cooperating with his team while playing the vocabulary game helped the players to develop effective strategies to get better scores, he said *"I liked the vocabulary game because we played in group. We could communicate and collaborate with each other to get the best scores"*. Opportunities for students' interaction not only promoted social behavior patterns, but it enhanced social ties among the players as well. In this context, Nancy pointed out that she could build a positive peer relationship with the other players while interacting with them; she stated *"I really liked Classcraft. I liked it when we did it in groups. I didn't know the others quite well at the beginning. Now I got to know them better"*. Similarly, George emphasized the importance of playing with friends to

be motivated to learn, he said *"the fact that we did the activities in the lab with my friends encouraged me to do it"*.

Autonomy of learning

Classcraft did not have planned educational outcomes that could affect the participant's' actual grades, so they had a total control over their own learning and progress. For instance, the participants could earn experience points (XP) by being positive and hardworking. However, they lose credits by showing up late to class or turning in incomplete assignments. With this being said, all the participants admitted that the gamified project was an environment that provided choices and minimal pressure. John highlighted the fact that in *Classcraft*, he and his team had to make their own decisions in order to win; he said *"the way we had to take decisions on the right answer was crucial in Classcraft"*. In addition, Leo and Nancy claimed that *Classcraft* supported free play as they were not obliged to abide by a certain educational curriculum as opposed to regular classes; Leo stated *"in Classcraft, we are free to do it or not"*, Nancy said *"we were free to do it not as in a regular class"*.

Challenges

With *Classcraft*, every class started with a variety of activities that challenged the players. Those challenges took the form of quests where the participants had to finish a task in a set time period or Boss Battles where the players had to work together to pass quizzes in order to defeat a boss monster and get extra XP or gold. These new assessment tools, as the researcher highlighted in his field notes, were fun ways to challenge players and to engage reluctant students as well. John agreed that *Classcraft* challenges added a realistic touch to

the gamified platform, making it look like a real game; he said *"personally, I liked the group challenges as if we were gaming for real"*.

New Gamification Design Element

Creating new experiences

Classcraft blends the elements of fantasy and reality to build an innovative learning experience for students. The researcher witnessed how the participants were thrilled with the idea of having real-life incentives and consequences as they were using *Classcraft*. The players, for instance, enjoyed getting extra time to finish an assignment or having a light snack in the lab. They were also cautious not to lose powers or die in the game. Nancy and Timothy mentioned that *Classcraft* offered them the possibility to experience interesting activities totally different from those of a regular class; Nancy said *"it is different from a regular class where we have boring activities. They give us activities not to entertain"*, she added *"we are not doing the same thing. Different personalization, different scores"*, Timothy stated *"we are listening more than doing in a regular class. Here, we are listening but doing different staff at the same time"*. Timothy indicated that the gamified experience allowed him to get engaged in a different learning experience, he said *"it allows us to learn English in another way"*.

Impact of Gamification on Students

From what the researcher has observed, the gamified intervention had a very positive impact on the participants. They used always to work collaboratively to gain XP points, they kept reminding each other to show up early to be rewarded of HP points and they did a lot of tutoring to help the others win and reach the team objectives. The following sections summarize four

impacts of gamification on the participants: motivational, emotional, cognitive and academic.

Motivational Impact

The researcher noticed that the participants' desire to help each other and to level up as well as their eagerness to answer questions and to participate in class are some evident effects of gamification on the players' motivation. This view was broadly supported by all the respondents. Nancy reported that the gamified intervention helped her feel more engaged to further enhance her learning in English because it created an entertaining and immersive social experience, she said *"I feel more motivated to learn English because it is entertaining, and as I said at the beginning, we were free to do it not as in regular a class"*. She also added that using *Classcraft* encouraged her to be more committed to her learning by attending remedial classes; she stated *"when I realized first that it is going to be in English, I was motivated because I love English. I did not use to go to remedial classes, but now I am more motivated to learn English"*. Timothy and Leo claimed that *Classcraft* suggested several gamification elements that served as a motivator for the players, such as avatars, points and golden pieces, he mentioned *"the fact that we had an avatar that we can personalize with the points and golden pieces that we gained throughout the game motivated us too"*, Leo said *"I feel motivated because I could personalize the avatar and do a lot of things with Classcraft, it is fun"*. Furthermore, Nancy suggested that *Classcraft* should be used in all subjects or at least for revision activities, she stated *"it would be fun if we can do it in regular classes or at least in remedial classes"*.

Impact on Academic Performance

The researcher observation notes revealed that the participants were able to perform the suggested activities, increase their oral participation in class and to complete all assignments except *Storybird* writing task. This academic performance is attributed to the fact that the players enjoyed the gamified environment which had a positive impact on their motivation and engagement. According to Tom, being actively engaged in the gamified environment and progressing through *Classcraft* levels helped the players to be actively engaged in their learning, he stated *"rewards were not only to advance in the game but at school too. We had the impression that we were advancing in two things at the same time"*. William, on the other hand, highlighted the advantage of game-based learning over traditional learning in serving the need of the participants to study and learn, he said *"we do not have the privilege to work in groups all the time in a regular class because teachers think that we will be influenced in a negative way. Here we can study using technology which is forbidden in class"*. He also added *"one of the benefits is learning English and helping the future generation"*.

Emotional Impact

It was evident to the researcher how the players were expected to have positive emotions, such as joy and excitement when they completed their tasks. *Classcraft*'s reward system increased those positive emotions by giving immediate recognition to users' success. However, to avoid the feelings of anxiety and frustration in case of failure, the platform design included low penalties compared to rewards and provided the players with several options to survive in the game. Being immediately rewarded, according to Tom, allowed

him to feel proud of his performance and achievement, he said *"the progress bar allowed me to be proud of myself and my achievement and of my team too"*. George also used the verb "adore" to describe how he liked the competitive touch in *Classcraft*, he stated *"I adored Classcraft because we could play against each other. We wanted to be the first, so there was a lot of competition"*. Moreover, all the participants talked about how they enjoyed being in the lab and how they appreciated working on assignments thanks to the fun element in the gamified environment, Andrew said *"we are working while having fun"* Timothy stated *"we are not bored doing it, we are pleased doing it"*, and Leo mentioned *"I played games such as this one, it is fun and amusing"*.

Social Impact

It was clear how *Classcraft* offered the participants the opportunity to communicate and interact with the teacher and with their classmates. They were able to cooperate helping each other to get better scores, to compete against the other teams and outperform them or interact socially with their team members. Moreover, when the teacher withdrew health points, the players were seen trying to develop survival strategies not to lose extra points. In this respect, Nancy mentioned how *Classcraft* allowed her to enhance her relationship with the other players, she said *"I did not know the others quite well at the beginning. Now I got to know them better"*. Similarly, Tom and John further explained that the gamified environment promoted social relationships among their peers. They could not only interact and communicate with each other but cooperate with their team members to win as well; Tom said *"in class, we are not usually working in teams where we play or work together. In Classcraft, we are in teams, and we do not want to deceive the others"*, John stated *"we are having fun here. We can*

laugh and work while in a regular class it is individual work without the possibility of talking, kind of antisocial. It is better to be in the lab". Finally, Timothy argued that *Classcraft* fostered the values of partnership and team spirit through attributing meaningful roles to players; he stated *"I still remember, last time, when wheel destiny said that we have to give certain XP to a player among our group. We quickly decided which player will take. A certain team spirit"*.

Challenges for Implementing *Classcraft*

In the eyes of the participants, *Classcraft* is far from being perfect. Although the gamified platform proved to be a rich experience which, according to the players, had a positive impact on their level of motivation and engagement, it falls short in certain areas. The following sections sum up three main challenges *Classcraft* was faced with, mainly the platform feedback mechanism, the utility of avatars and the use of *Classcraft* outside school.

Classcraft Feedback Mechanism

Classcraft embodies reward mechanics that provide users with instant feedback for their actions and performances on a daily basis. The teacher could show students their progress in class and celebrate their achievements with them. This helped the participants to progress against the other teams to reach potential victory. However, according to Tom and John, a more successful experience with *Classcraft* would require the inclusion of an additional feedback mechanism, such as a weekly report which display the teams' ranking and suggest bonuses for the best teams. In this way, students would get recognition for what they are doing in class; he said *"I suggest we can have a weekly report of our progress, a kind of top-three players or best teams to have another reason to be better because,*

actually, we progress, but there is no bonus to what we are doing", John stated *"as Tom said, we do activities, but the end what? I think every week or month, I don't know, we can have something".*

Utility of Avatars

Classcraft offered the users a wide range of features to customize their avatars, such as changing clothes, hair style, equipments, pets, etc. It turned out that being an avatar in a gamified environment, as *Classcraft*, had a positive impact on the respondents' motivation and engagement. On the other hand, John argued that a more engaging use of avatars would require leveraging the capabilities of customization to immerse the users in the learning. Players, according to John, need to interact with their avatars in a more exciting way as in a real game; he said *"to make it more like a game, not just a platform, we can do something with our characters"*. Andrew elaborated further that *Classcraft* would also need to encourage interactivity among avatars; he suggested that teams' avatars could compete with other teams' avatars in some way; he stated *"I suggest we can do something with our avatars, instead of just personalizing them, such as fights"*.

Using Classcraft Outside the Classroom

Although *Classcraft* can be used beyond the four walls of the classroom, the researcher assigned one homework to students during the gamified intervention. Because five out of eight participants could not do *Storybird* assignment in due time, they were asked to do it as a homework, but no one did it because most of the participants claimed *Storybird* to be an inefficient learning tool. However, Tom suggested that *Classcraft* can be used as a homework-assignment game,

where teachers can reward the players for doing extra work at home. In this way, students can seek further progress and achievements in the game and enhance their engagement with their study; he said *"playing at home, not just in the lab, such as having a mini game proposed by the teacher, which will give us XPs or GPs or will tell the teacher about the work, and he can give us points. Like this, we can win something while playing at home. We will be more engaged if we can play outside school"*.

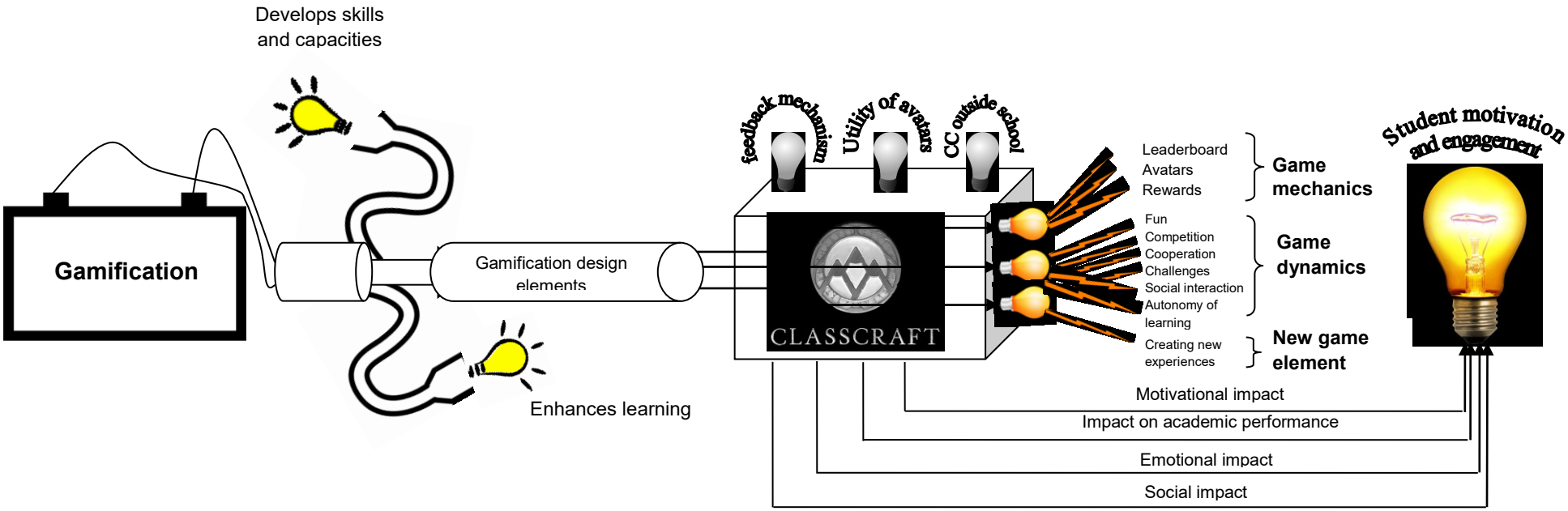


Figure 4. A grounded theory on motivating ESL learners using Gamification

Chapter 5 -- Discussion

The following chapter tackles three main aspects. First, it restates the purpose of the study and the research questions that guided it. Next, it discusses the findings and the major conclusions of both the quantitative and qualitative components of the current research in the context of the current literature. Finally, it presents limitations of the study together with suggestions for future research.

Research Purpose and Questions

The best way to examine the key findings from the research is to restate the purpose and the questions that guide it. The overall purpose of the current study was to implement and evaluate a gamified instructional design in teaching ESL high school students while analyzing the gamification elements that would affect their motivation and engagement. Based upon this purpose, the study identified the two following questions:

1. What impact does using gamified learning materials have on students' motivation and engagement?
2. What gamification elements would motivate and engage ESL learners?

Conclusions of the Main Findings

Analysis of the qualitative and quantitative data from the study yielded some interesting implications. As the literature review points out, gamification has the potential to increase students' learning and to develop their skills and capacities. In the same context, Buckley and Doyle (2014) claimed that online gamified learning has a positive impact on learning outcomes. Moreover, the greatest advantage of using gamification elements is seen in its capacity of

enhancing students' motivation, enjoyment, social interaction and academic performance. Likewise, Kapp (2012) argued that game mechanics and dynamics, such as rewards, avatars, competition and social comparison can have significant effects on students' motivation and enjoyment as well as their engagement with classroom materials. Below are the questions the thesis is trying to answer alongside implications from the findings and literature review.

What impact does using gamified learning materials have on students' motivation?

The findings from both the quantitative and qualitative analyses suggested that gamified learning materials have a positive impact on students' motivations. Prior to the gamified intervention, the quantitative component of this study showed that while 2 out of 8 participants claimed that student book and teacher worksheets/handouts were effective for their learning, the majority were eager to use online instruction as a different learning experience. One possible explanation of these results is that students were more motivated to use online learning than current conventional learning methods because they felt that innovative technologies are more pleasurable and can help them learn better. Similarly, the post-experiment questionnaire findings revealed a high level of satisfaction and enjoyment towards using *Classcraft* and the other online learning platforms, suggesting that the participants' level of motivation improved after the gamified intervention. This was clearly indicated in the overall motivation rate reported by the respondents (75% a lot of motivation, 25% average motivation). The participants, having enjoyed the gamified leaning experience, were expected to recommend using *Classcraft* in their regular English class. These findings are consistent with Dominguez, Saenz-De-Navarrete, De-Marcos, Fernández-Sanz,

Pagés and Martínez-Herráiz (2013) finding. Both Dominguez and his team and the present study argued that gamification platforms had the potential to increase the participants' motivation significantly over time. In fact, according to the qualitative component of this study, a student focus group interview was conducted to infer insights about the participants' experiences with gameful learning. Based on the theme (impact of gamification on students) and the theme (importance of gamification in education), effects gamification had on students have been identified as motivational, academic, emotional and social.

Impact of Gamification on Students

The desire to participate in class, to help other students and to level up was considered to be strongly associated with gamification. Positive impacts of gameful learning were perceived in the willingness of the participants to be more engaged in enhancing their learning and in their desire to have gamification incorporated in their academic curriculum or at least in their revision activities. In agreement with this finding is Nikkila's (2013) result in which participants' engagement was maintained over a long period of time thanks to game design related to user interaction and Mejia's (2013) finding wherein the increase of students' engagement was associated to the use of game-like elements.

Another interesting finding was that gamification proved to be effective in increasing the participants' academic performance. They could perform the suggested activities, participate orally in class and complete their assignments. In addition, the gameful environment was perceived to be a helpful factor in engaging students in their learning. The present finding supports Dickey's (2005) result in which the game design features keep students engaged through the

different tasks they may work through. Similarly, it concurs with Groff, Howells and Cranmer (2010) who established that gameful learning which was built around students' interests could enhance their motivation. This motivation was clearly the driving force behind students' positive achievement.

The research findings also provided evidence of the emotional impact that gamification had on participants. From the gamified intervention, it was apparent that the players were motivated because they experienced positive feelings like joy and excitement when using *Classcraft*. Furthermore, most respondents made specific reference to rewards and fun as factors that allowed them to feel proud of their achievements and to enjoy working on assignments. This reinforces the claim by Dominguez et al, (2013) that rewarding players on positive achievements after creating cycles of mastery which increase the game difficulty has a positive impact on students both emotionally and cognitively. This finding also emphasizes the claim by Lee and Hammer (2011) that game elements are motivating because of their impact on players socially, emotionally and cognitively.

The study interviews provided solid evidence that gamification had a social impact on students. The participants were seen cooperating with each other to get better scores, competing against the other teams, developing strategies to survive in the game and interacting socially with their team members. All these social aspects of the players' behavior can be considered as an indication of the students' motivation and engagement. Moreover, this study revealed that the use of gamification is an effective method not only to enhance social relationships among peers but to foster the values of partnership and team spirit as well. These findings agree with Lee and Hoadley's (2007) that the interaction in videogames

has the potential of allowing students to build different in-game identities through obtaining other players' recognition and getting meaningful roles. Likewise, Liaw (2008) established that gamification has a positive impact on students' motivation thanks to its capacity to increase interaction with teacher and classmates.

Importance of Gamification in Education

The current research revealed that gamification motivates students through enhancing learning in various ways. According to the respondents, gameful learning provided a joyful atmosphere where students were excited to learn and to actively participate while having fun. Gamification also allowed students to boost and reinforce their self-esteem while learning thanks to peer recognition. These findings relate strongly to the work done by Chantzi, Plessa, Gkanas, Tsolis and Tsakalidis (2013) that gamification has the potential to make learning a joyful experience. In this way, learners can become more motivated to learn dull or difficult subjects and actively participate in the learning process. The present findings also concur with Werbach and Hunter (2012) that any gamification project needs a process to make it successful. This process includes emotional elements such as fun, play and user experience as well as measurable systems to serve concrete objectives. One of the "six steps design" that Werbach and Hunter (2012) suggested included addressing different emotional needs as players are not the same. In the context of the present research, players were identified as socializers who need to engage with their friends and peers.

A further analysis of the study interviews suggested that gamification motivates students by allowing them to develop various skills and capacities. First, it helped them to enhance their knowledge of familiar words and develop a

significant understanding of new vocabularies. It also encouraged communication and feedback between the teacher and the students and between the students themselves as well. This dynamic approach motivated the participants to communicate in English freely and safely. In addition, gamification had a positive impact on the participants' cognitive skills, mainly memory and decision-taking. They were able to perform tasks efficiently as their mind was stimulated. These results are fully supported by Browne, Anand and Gosse (2014) who designed gamification approaches for two tablet apps to help learners improve their basic literacy skills. Browne (2014) and his team concluded that the two apps, which focused on two main areas: homophones and punctuation, were effective in increasing learners' engagement by allowing them to develop their literacy skills. The current study findings are also supported by Beach's (2012) who argues that using game elements like point systems, juicy feedback and leaderboard helps learners with developmental disabilities to enhance their reading and writing skills.

What Gamification elements would motivate and engage ESL learners?

Besides enjoyment, the qualitative analysis of the focus group interview indicated that game elements integrated in *Classcraft* had the potential to increase users' motivation and engagement. These positive impacts, according to the participants, were attributed mainly to certain game mechanics and game dynamics, which are: leaderboard, avatars, rewards, fun, competition, cooperation, social interaction, autonomy of learning and challenges. Creating new experiences was a new game element that emerged from the participants' responses. These findings suggested that *Classcraft* design was useful in creating motivating and enjoyable learning experiences.

Gamification Elements Design

Game mechanics

Although the quantitative results revealed leaderboard to be the least enjoyed component in the gamified intervention, the qualitative data analysis reported *Classcraft* leaderboard to be an effective motivating element. Apart from generating a healthy competitive excitement and incredibly keen impulses to play, *Classcraft* leaderboard allowed the participants to check their progress over time and to compare players and teams' scores and performances, which created a powerful motivator for each team to do better to reach higher ranks. As discussed in the literature review, this emphasizes the claim by de-Marcos, Dominguez, Saenz-De-Navarrete and Pagés (2014) that game elements, such as leaderboard presented better performance levels in regards to academic achievement for practical assignments related to skill acquisition. These results also reinforce the claim by O'Donovan, Gain and Marais (2013) that gamification elements, mainly leaderboard and badges, enhance students' understanding and their engagement with the learning materials.

Evidence of the effectiveness of avatars as a motivating and an engaging game element was raised in the participants' feedback. The post-experiment questionnaire indicated that 37,5% of the respondents enjoyed using avatars in their learning experience. Furthermore, some interviewees highlighted the opportunity that an avatar-based environment provided them to interact with the assigned content, which helped them to engage with the learning activities. A key value of avatars that was raised by participants was the various personalization features *Classcraft* offered them. Those features allowed them to come up with

unique designs that match their personal image and identity. These results support Zichermann and Cunningham's (2011) that allowing players to customize their avatars in games will help add values to their experiences. This is further reinforced by Falloon's (2010) that avatars provide students with a flexible and a creative method to construct their knowledge representations, and that customizing avatars in students' images adds to their sense of ownership and identity.

Rewards are another important game element that emerged as a factor which impacted students' motivation and engagement. It was reported, in both quantitative and qualitative analyses, that rewards in the form of points, golden coins, powers, levels and pets were genuinely effective in maximizing participants' efforts and concentration as they recognize players' achievements. Furthermore, the use of points as a virtual currency to level up or to buy equipments and get additional powers motivated the participants to contribute more to the success of their teams. As the present study used measurement rewards that evaluated the learner's performance either against other teams' performances or against standards set by the game, these findings relate strongly to the claim of Kapp (2012) that measurement rewards, unlike completion rewards, are crucial to engage learners by feedback and increase their intrinsic motivation. These results are also supported by Zichermann and Cunningham (2011) who identified an engaging reward system referred to as SAPS (status, access, power and stuff). In *Classcraft*, status, access and power were incorporated within the gameful platform. Status element was the leaderboard which displayed the position of players vis-à-vis their opponents. Access included access to special powers or to advantages during the game, such as getting extra

time to finish an assignment or having a light snack in the lab. As for power, the fact that each player enjoyed a special status and had special powers in the game (Mage, Warrior or Healer) allowed him/her to enjoy a certain control over other learners in the game.

Game dynamics

Most participants reported that having fun while learning was engaging. *Classcraft* gameful features allowed students to study while having fun. These same features were effective in catching their interest and allowing them to live an amusing experience. These results concur with Werbach and Hunter (2012) that incorporating different types of fun to appeal to players will motivate and engage students. According to the respondents, *Classcraft* incorporated three types of fun: Hard fun (fun for overcoming challenges), Experimental fun (fun for trying out new experiences) and Social fun (fun for interacting with others). These findings are also supported by Li, Grossman and Fitzmaurice (2012) who claimed that the fun aspect in gamification allows the learning content to be enjoyable, engaging and effective.

The competitive aspect of *Classcraft* motivated students to strive to reach higher scores. The study concluded that playing one team against the other helped the players to optimize their performance to finally get superior results. This competition was better experienced with live tracking thanks to *Classcraft* leaderboard. This finding provides weight to the claim made by Sailer, Hense, Mandl and Klevers (2013) that using leaderboard as a game element fosters competition and addresses achievement and motivation.

Another motivating game dynamics that emerged from the qualitative data was cooperation. The pre-experiment questionnaire revealed that all respondents agree that cooperation is a motivating factor in their learning. The field observation notes, also, indicated that advanced students were seen working as mentors to encourage less advanced students maximize their achievements. The players worked together to complete the assigned tasks which contributed to the progress of the team as a whole. This strategy motivated students and held them more responsible for their individual actions. These findings agree with the claim made by Kapp (2012) that cooperation is an engaging factor in gamification because it allows students to learn content from peers and to lead a rich discussion about the subject matter. This is also supported by Lee and Hoadley (2007) who argue that through game mechanics, players are motivated to cooperate to reach common goals or compete to perform better than the other teams.

The findings also pointed out to peer social interaction as a motivational game dynamic in *Classcraft*. Apart from fostering competition and cooperation in the classroom, gamification was effective in building positive relationships between players and enhancing social ties with one another. By developing such social connections, students were more motivated and engaged to learn. As indicated in the claim of Werbach and Hunter (2012), for gamification to be motivating, it needs to address the needs of each type of players. Creating social connections and having the feeling of being part of a group are crucial in motivating socializers who love to engage with others for intrinsic reasons.

Another game dynamic which proved to be a motivating factor for students was the autonomy of learning. *Classcraft* supported free play as it does not have planned educational outcomes that could affect the participants' actual grades, so

they had a total control over their own learning and progress. In addition, the participants were motivated to learn because the gamified project was an environment that provided choices and minimal pressure. These findings are supported by Klopfer, Osterweil and Salen (2009) who claim that games provide learners with some curricular choice and certain control over their learning because they are free to discover and adapt learning styles that suit them. Another support comes from the claim made by Cheng (2009) that the sense of autonomy and ownership in games provide learners with a great flexibility to design and implement their own ideas. This motivates them to spend more time on their learning.

The other motivating game dynamic raised during the focus group interview was challenges. It was generally observed that using challenges in *Classcraft* as an assessment tool was a fun method to stimulate players and to engage reluctant students as well. It was also reported that *Classcraft* challenges motivated the majority of the players (75%) because it added a realistic touch to the gamified platform, making it look like a real game. This relates strongly to what has been discussed in the literature review that challenges have the potential of initially engaging learners into a task and encouraging reluctant ones to start learning content (Kapp, 2012).

New Gamification Design Element

On the other hand, the qualitative analysis of the present study revealed that creating new experiences for students thanks to elements of fantasy and reality was a new motivating gamification element in *Classcraft*. The finding indicated that real-life incentives and consequences embedded in *Classcraft* motivated

students because they allowed them to connect with the learning experience unlike methods used in a regular class. Kapp (2012) suggests including "a fantasy-based setting" instead of "a realistic" setting in the design of gameful learning materials because it enhances skill transfer and it allows learners to apply skills at a higher level of performance. However, the present study proposes using both settings to create original learning experiences that are effective in motivating and engaging students.

Challenges for Implementing Classcraft

To get the best out of *Classcraft*, students suggest the following: (a) incorporating additional feedback mechanisms, such as a weekly report which will display the teams' ranking and suggest bonuses for the best teams, (b) leveraging the capabilities of customization to immerse the users in the learning and providing players with more options to interact with their avatars in a more exciting way, (c) using *Classcraft* as a homework-assignment game so that students could seek further progress and achievements in the game and enhance their engagement with their study. These suggestions are consistent with previous research done by Amy (2010) and Werbach and Hunter (2012). The first and the second suggestions mentioned above concur with three of the seven core concepts Amy (2010) suggests for a *Smart Gamification* that would produce more engaging products and services; those suggestions are:

Use Progress Mechanics to "light the way" towards learning and mastery.

1. As players progress, unlock greater challenges, customization and privileges.

2. Give players real power via stats, voting, earned roles, and crowd sourcing.

The participants' recommendations are also supported by Werbach and Hunter (2012) who put forward a design framework that involves six steps. "Devise activity cycles" is one of those steps which corresponds to the last suggestion made above. It means that a major challenge at the end of the line and small positive surprises are important aspects designers are recommended to consider to help players feel a certain emotional satisfaction.

Complementary Findings

Limitations of Current Teaching Strategies

The study findings pointed out to limitations of both conventional teaching methods and some technologically-advanced teaching platforms. Apart from lacking interest and learning interaction and undermining the sense of creativity, traditional teaching methodologies were reported to be more curriculum-centered than learner-centered because they do not fulfill the socio-affective needs of students. In fact, the participants' interaction with *Classcraft* increased their interest significantly as they were motivated to interact with the learning materials and to collaborate with their peers while advancing in the game. Similarly, Dewey (2011) and Vygotsky (1978) supported the use of game playing to enhance students' motivation because it allows them to have fun, interact with others and experience small successes. Keller (1999) also claims that students are more likely to feel motivated to learn when teachers are able to stimulate the learners' attention and make the learning materials relevant.

On the other hand, effectiveness was identified as the main motivating factor in designing online teaching platforms. All respondents claimed *Storybird* to be the weak link among the suggested online platforms because the suggested learning materials were neither interesting nor relevant for their stories, which had a negative influence on the participants' motivation. This finding is largely supported by Wang (2015) who argues that one of the most effective methods to motivate and engage students in online games is to provide them with different game modes and variations to keep the gameplay fresh.

Conclusion and Implications

This constructivist grounded theory study evaluated the benefits of gamification elements design in *Classcraft* which have the potential to motivate and engage students. The statistically as well as the qualitatively significant relationship revealed between the implementation of gamification elements design and enhancing students motivation and engagement is particularly encouraging.

Pedagogical Implications

The results of this study can revolutionize ESL teaching. All teachers or professionals working with young learners can draw upon this study analysis and recommendations in order to enhance students' motivation and engagement. In the light of these findings, the present study suggests the following contributions:

ESL high school students have their particular realities and situations that can cause a lack of motivation which contributes to poor academic achievement. With the positive impact of gamification revealed in this study, implementing gamified teaching methodologies throughout the ESL high school curriculum or

at least during remedial classes has the potential to increase students' motivation and engagement and help to evolve the current educational methodologies into something more fun.

The use of game elements does not always guarantee positive results. Gamification is not only about applying any game mechanics and any game dynamics to learning materials. It is more about understanding the students' needs and the overall context which is likely to motivate them to be able to apply the correct gameful design with greater chances of success.

Another part of adopting a motivating gameful design is to create unique experiences for students. Well designed gamification blends fantasy with real-life incentives and consequences to help learners connect with the learning materials and learn the desired behavior and actions.

With certain amendments, *Classcraft* can be a fully fledged gamified model to use in the classroom. First, it is crucial to incorporate additional feedback mechanisms, such as a weekly report which will display the teams' ranking and suggest bonuses for the best teams. It is also important to leverage the capabilities of customization in *Classcraft* to immerse the users in the learning and to provide players with more options to interact with their avatars. Finally, *Classcraft* can be used as a homework-assignment game so that students could seek further progress and to enhance their engagement with their study.

Theoretical Implications

Although there is an increasing number of studies that have explored the benefits of gamification systems in many fields such as industry, computer

science, management, social services etc., there is little to no research on the benefits of gamification systems at the high school level, mainly in the ESL field.

Much of the suggested gamification designs literature does not specify in any detail the types of game mechanics and game dynamics that must be included to design a motivating gameful system meant for ESL learners. However, this study model adds to theory by identifying not only previously discussed elements in gamification but a new game dynamic as well which are necessary for an effective ESL gameful system. Therefore, the present study theory has the potential to guide further studies into designing educational gamification systems.

Additionally, the model proposed in the current study highlights the benefits of incorporating gameful designs in education and points out to the positive impact gamification can have on students. As mentioned in the literature review, several studies have explained how gamification impacts users positively, but the emergence of the four positive impacts of gamification (motivational, academic, emotional and social) from this research is an important addition to theory in this field.

Study Limitations and Further Research

The present study has limitations that must be acknowledged. First, the period of participant observation was limited to the lab sessions where the gameful intervention took place. Therefore, the researcher did not have the chance to observe participants interacting with the gamified platform in their regular English classes with the presence of other students. In this context, constructing a theory about behavioral situations requires a clear-cut perception of students' interactions, which can be reached only through close observations in natural

settings. Thus, there should be more field studies supported by teachers and students feedback to help teachers try out learning applications and integrate them in the curriculum.

Beyond the study observation, the number of participants and the research site were limited. Given the small sample size of the study participants, it might be difficult to generalize the results to ESL learners. Additionally, the focus on one educational institution is considered as another shortcoming of this study because the findings do not recognize differences between educational institutions in term of ESL clientele and socio-economic background for instance, which may have an impact on students' motivation and engagement. Therefore, it would be beneficial to replicate this study using enough sample sizes and various research sites to reach more convincing results.

Moreover, the present study is limited by its reliance on one single gamified platform. The study findings are drawn from the use of *Classcraft* as a gamified model. Other gamification systems might have other design approaches to motivate learners. Therefore, it might be difficult to make broad recommendations using these findings. In future research, the study of other gamification platforms will surely be helpful to yield solid findings.

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Appendix A - Certification of Ethical Acceptability for Research Involving Human Subjects

UNIVERSITE Concordia UNIVERSITY

CERTIFICATION OF ETHICAL ACCEPTABILITY FOR RESEARCH INVOLVING HUMAN SUBJECTS

Name of Applicant: Mourad Majdoub

Department: Faculty of Arts and Science \ Education

Agency: N/A

Title of Project: Promoting High School ESL (English as a Second Language) Learner's Motivation Through the Use of Gamified Instructional Design

Certification Number: 30004556

Valid From: June 02, 2015 to: June 01, 2016

The members of the University Human Research Ethics Committee have examined the application for a grant to support the above-named project, and consider the experimental procedures, as outlined by the applicant, to be acceptable on ethical grounds for research involving human subjects.

Dr. James Pfaus, Chair, University Human Research Ethics Committee

Appendix B - Consent Form for Participants' Parents or Guardians

Veuillez lire ces informations attentivement
Le 22 mars 2015

Cher parent,

Nous collaborons avec votre enfant dans le cadre d'un projet passionnant qui se penche sur l'utilisation des mécanismes du jeu comme outil pédagogique pour développer la motivation et l'engagement des élèves du secondaire en anglais langue seconde. En utilisant Classcraft (un jeu de rôle avec des mages, des guerriers et des guérisseurs), les élèves créent des personnages qui peuvent apprendre des pouvoirs spéciaux et gagner des niveaux. La manière dont ils jouent dans la salle de classe est directement liée à la survie et à l'épanouissement de leur personnage et de leurs coéquipiers. Avec Classcraft, les élèves apprennent à participer et à s'engager avec ce qu'ils apprennent afin qu'ils puissent rendre leur personnage plus puissant.

Votre enfant a été sélectionné pour participer à cette étude. Il/elle sera invité à répondre à des questionnaires et des entrevus de groupe avant, pendant et après l'utilisation des outils pédagogiques présentés dans le projet. Les participants seront invités à faire des activités en anglais en équipe de trois ou quatre élèves, ce qui encourage des élèves qui ne sont pas portés à socialiser à travailler ensemble pour gagner. Pour utiliser la plateforme proposée, chaque élève doit choisir un personnage parmi trois classes de personnages: le Guérisseur, le Mage ou le Guerrier. Chacune a des propriétés et des pouvoirs uniques, et est conçue pour rejoindre différents types d'élèves. Les personnages sont personnalisables par l'élève durant le jeu et peuvent être accompagnés de familiers. Après chaque activité ou exercice, les élèves vont soit gagner ou perdre des points, ce qui permettra à la fin d'avoir une seule équipe gagnante.

Votre enfant est libre soit de participer ou non à cette étude et de s'en retirer à tout moment. Les renseignements fournis seront protégées en attribuant des noms fictifs aux participants. Puisque le projet sera fait soit durant les heures de récupération ou d'autres périodes du midi, le chercheur s'assurera qu'il n'y aura pas de conflit de temps de participation avec d'autres matières. Si vous avez des questions sur le projet, n'hésitez pas à contacter le chercheur, M. Mourad Majdoub à (514) 892-1530 (mourad.majdoub@cssmi.qc.ca) ou le superviseur de la recherche, Dr. Vivek Venkatesh à (514) 848-2424 ext. 8936 (vivek@education.concordia.ca). Si vous avez des questions sur le droit de votre enfant tant que participant à la recherche, veuillez contactez le responsable d'éthique de la recherche à l'université Concordia à (514)-848-2424 ext. 7481 (oor.ethics@concordia.ca).

Nous apprécions votre collaboration et votre soutien pour aider à améliorer l'enseignement et l'apprentissage dans nos écoles. Veuillez retourner le formulaire de consentement signé au professeur de votre enfant le plutôt possible en indiquant si vous êtes d'accord ou pas de permettre à votre enfant de participer à ce projet.

Cordialement,

Vivek Venkatesh, Ph.D. M.	Mourad Majdoub
Superviseur de recherche	Responsable de recherche
Université Concordia	École Secondaire Liberté-Jeunesse

FORMULAIRE DE CONSENTEMENT PARENTAL

Veuillez lire pour vérifier si :

- ✓ Vous avez été informé de sujet de ce projet de recherche.
- ✓ Vous comprenez que la participation de votre enfant à ce projet est volontaire.
- ✓ Vous comprenez que vous pouvez révoquer ce consentement et retirer votre enfant de ce projet à tout moment et sans préjudice.
- ✓ Vous comprenez que les commentaires de votre enfant seront enregistrés.
- ✓ Vous comprenez comment la confidentialité sera maintenue.
- ✓ Vous comprenez que les données peuvent être utilisées pour fin de publication, et elles seront présentées de façon confidentielle en tout temps.

Veuillez choisir l'une des deux options et signer ci-dessous pour confirmer :

☐ J'accepte que mon enfant participe à l'étude dans les conditions décrites ci-dessus.

☐ Je n'accepte pas que mon enfant participe à l'étude dans les conditions décrites ci-dessus.

Nom et prénom de l'enfant :_____

Nom et prénom de(s) parent(s) : _____

Signature : _____ Date : _____

Appendix C - Assent Form for Participants

Veuillez lire ces informations attentivement
Le 22 mars 2015

Cher élève,

Nous vous invitons à participer à une recherche qui a l'objectif de mettre en oeuvre et évaluer l'utilisation des mécanismes du jeu comme outil d'enseignement d'anglais langue seconde au secondaire.

En utilisant Classcraft, vous allez soit gagner ou perdre des points après chaque activité ou exercice, ce qui permettra à la fin d'avoir une seule équipe gagnante.

En participant à cette étude, vous serez invité à répondre à des questionnaires et des entrevus de groupe avant, pendant et après l'utilisation des outils pédagogiques présentés dans le projet.

La participation dans ce projet de recherche s'étendra sur une période de 4 à 5 semaines. Par conséquent, vous devez être présent à la récupération (la période du projet) selon l'horaire suggéré par le chercheur.

Veuillez comprendre que vous êtes libre de participer ou non à cette étude. D'ailleurs, si vous décidez d'y participer, vous êtes libre de vous retirer et de refuser d'accomplir n'importe quelle tâche à tout moment.

Si vous avez lu ce texte ci-dessus et vous êtes prêts à participer à cette étude, veuillez signer ci-dessous. En signant ce formulaire, vous confirmez que:

- ✓ Vous souhaitez participer à cette étude,
- ✓ Vous avez lu, compris et accepté le texte ci-dessus,
- ✓ Vous comprenez que vous allez répondre à des questionnaires et des entrevus de groupe.
- ✓ Vous comprenez que vos commentaires seront enregistrés.
- ✓ Vous comprenez que vous pouvez se retirer à tout moment.

Nom et prénom : _____

Signature : _____ Date : _____

Appendix D – Participant Data Collection Pre-experiment Questionnaire

1. I enjoy taking English courses.

Strongly agree Agree Disagree Strongly disagree Don't know

2. I learn more with my student book and the teacher's worksheets.

Strongly agree Agree Disagree Strongly disagree Don't know

3. If the activity is interesting, I learn better.

Strongly agree Agree Disagree Strongly disagree Don't know

4. Working on assignments or projects online helps me to be good in English.

Strongly agree Agree Disagree Strongly disagree Don't know

5. I like to compete myself to my colleagues to see how good I am in English.

Strongly agree Agree Disagree Strongly disagree Don't know

6. I perform better when I work in teams rather than when I am working alone.

Strongly agree Agree Disagree Strongly disagree Don't know

7. Do you play video games?

Yes No

8. How long have you been playing video games?

Never Less than a month more than a month 6 months More than a year

9. With games, I learn better.

Strongly agree Agree Disagree Strongly disagree Don't know

10. I feel that winning is important in both school and games

Strongly agree Agree Disagree Strongly disagree Don't know

11. I like to get rewards when I do well in my class.

Strongly agree Agree Disagree Strongly disagree Don't know

Appendix E – Participant Data Collection Post-experiment Questionnaire

1. I had fun using Classcraft.

Strongly agree Agree Disagree Strongly disagree Don't know

2. I had fun using the online platforms (Voki, Storybird, Kahoot, Goanimate and Socrative).

Strongly agree Agree Disagree Strongly disagree Don't know

3. How would you rate your experience with Classcraft?

Excellent Good Fair Bad Don't know

4. How would you rate your experience with the online platforms?

Excellent Good Fair Bad Don't know

5. What online platforms you have enjoyed the most?

Voki Storybird Kahoot Socrative

6. I learnt better with Classcraft and the other online platforms.

Strongly agree Agree Disagree Strongly disagree Don't know

7. The content of the activities was meaningful.

Strongly agree Agree Disagree Strongly disagree Don't know

8. The tasks were challenging.

Strongly agree Agree Disagree Strongly disagree Don't know

9. I finished all the required tasks.

Strongly agree Agree Disagree Strongly disagree Don't know

10. What fun aspect you enjoyed the most?

Overcome a challenge Enjoy doing the activity Interaction with the others

11. What element(s) you have enjoyed in Classcraft?

Rules Leaderboard Avatars Levels Rewards (equipments, pets, etc.)

12. What element(s) you have enjoyed in the online platforms?

Challenges Freedom to fail Feedback Points

13. How motivated are you to learn English.

A lot Average A little Not at all Don't know

14. I wish I can use Classcraft in my regular English class.

Strongly agree Agree Disagree Strongly disagree Don't know

Appendix F – Focus Group Interview Questions

1. Describe your experience with Classcraft? What did/didn't you like about it?

2. Describe your experience with the other online platforms (Kahoot, Voki, Storybird, etc.) What did/didn't you like about it?

3. What skills Classcraft and the other online platforms helped you develop?

4. What motivated you to do the activities?

5. What was challenging about the activities?

6. What helped you focus on the activities?

7. How do rewards in Classcraft such as scores, levels and achievements motivated you to learn English?

8. What elements in Classcraft and the online platforms you perceive as the most essential in enhancing your motivation? (rules, avatars, scores, levels, rewards (equipments, weapons, skills, etc.), leaderboard, fun, feedback, etc.)

9. How much fun did you enjoy with Classcraft and the other online platforms?

10. What is the difference between a regular English class and the intervention?

11. Do you have any feedback to make Classcraft better?