The Effect of Gamification on E-learning

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9th of December, 2019

1. Introduction

Technology has changed the world drastically in many ways. This change includes the setup of a classroom as it was known fifty years ago. Traditional teaching methods do not recognize the different requirements of individual students; in terms of time, place, repetition, and duration, among others. E-learning is now an alternative to the traditional classroom setup. With the sense of freedom offered by e-learning, students gradually become more responsible for their learning and more independent; they become the seekers of information. The current student population consists mainly of millenials who are familiar with the technology and have taken to e-learning. (Gambari, Taju, Ogunlade, & Osunlade, 2017: 25-26; Alabbasi, 2018: 34).

Gamification is used commonly in the business world and in certain educational contexts. Games are commonly used to prompt individuals to move on to the next level. In the educational context, gamification encourages e-learners to study and practice what they have learned in lessons (Dicheva, Dichev, Agre, & Angalova, 2015: 1-2). The more tedious a task becomes, the less motivation there is to perform such a task. Gamification helps learners overcome that barrier of lack of enthusiasm (Kaufmann, 2018: 125).

The main focus of this paper is "The Effect of Gamification on E-learning". Its purpose is to examine how gamification impacts e-learners. This issue is of growing importance due to the increased interest in e-learning. E-learning is not only complementary to educational institutions; it is now an alternative (Alabbasi, 2018: 34). On a side note, e-learning on its own does not increase the efficiency of education; it still depends on the cognitive state of the learner (Arana-Llanes et al., 2018: 3360). In an effort to improve the quality of e-learning, gamification can be introduced. Gamification fortifies knowledge and valuable skills such as problem solving (Dicheva et al., 2015: 1); hence, the significance of this research.

This paper first provides a literature review of gamification and e-learning. It starts by giving an overview on gamification, where it provides its definition and some background information.

Then it goes over the applicability of gamification while pointing out its advantages as well as its setbacks. Afterwards, it moves onto the gamification techniques where it introduces its most common techniques. In the following section, the paper gives an overview of e-learning. It provides an explanation of what it is and the set of determinants that impact its effectiveness. It also points out the different barriers of e-learning. In the third section of the literature review, the paper explains how e-learning can be improved via gamification. It lists out various ways in which gamification helps e-learners overcome e-learning barriers. Afterwards, it presents a gamification design suitable for e-learning. The paper then wraps up the third section by pointing out the impact of gamification on e-learners' results. In the last section, the research gap is discussed. After the literature review, the paper moves on to the methodology.

2. Literature Review

2.1 Gamification Overview

Gamification has many uses in various industries. This makes it an ambiguous word. This chapter will provide different definitions of gamification and discuss its applicability. Furthermore, it covers the different gamification techniques that are most commonly applied and the determinants of the level of efficacy of the techniques in question.

2.1.1 Definition and Background of Gamification

Gamification is a phenomena that is making strides in the business world. It is a relatively new yet rapidly expanding concept in the industrial and educational world. However, the concept has existed for a long time. Badges, ranks and rewards go back in the military world. A good example is early Soviet Russia. Instead of monetary incentives leaders of the Soviet Union used game elements to motivate people to perform well at work (Dicheva et al., 2018: 1). Yet, The term itself is of recent origin. According to Dicheva et al., the word 'Gamification' was first documented in 2008. All the same, it did not gain fame until 2010.

In literature, gamification has been defined as the use of game mechanics and dynamics in non-games contexts (Dicheva et al., 2018: 1; Negruşa, Toader, Sofică, Tutunea, & Rus, 2015:

11162). Given that the definition of gamification depends so much on the term "game", it is beneficiary to define game first. One definition is as follows: a game is "a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome" (Chen, Huang, Gribbins and Swan, 2018: 42). According to Kaufmann (2018: 126), conventionally, there are four elements needed to consider something a game; a goal, rules, a feedback system, and voluntary participation.

Adding to the previous definitions, Xu (2012: 1) claims that gamification is "the use of game play mechanics for non-game applications, particularly consumer-oriented web and mobile sites, in order to encourage people to adopt the applications". It is noteworthy, that given the aspect where subjects are given an incentive to use the applications, there is voluntary participation, which is the last of the four key elements of a game. In other words, gamification is the transformation of a system that allows it to be approached in an entertaining manner similar to that of game (Alabbasi, 2017: 181). These definitions revolve around the same overall idea. Thus, all of these definitions are integral to this paper.

2.1.2 Applicability of Gamification

Such a concept, which has been integrated in various domains such as business, marketing, corporate management, health, and wellness and ecology initiatives, has proven to have an overall positive impact (Dicheva et al., 2018: 2). The coming sections discuss its advantages and disadvantages thoroughly.

2.1.2.1 Advantages of Gamification

The benefits of using game mechanics and game thinking for non-entertainment purposes are numerous. As mentioned previously in the definition, gamification includes elements of games. Previous research papers on the subject assert that aspects like score, points, badges, goals, leaderboards, feedback, rewards, experience, achievements, profile, difficulty, challenges, level, virtual goods and progress bars are present in gamified environments (Can & Dursun, 2019:

121). The first element, the objective, must be clarified in the game environment. Hence, users are given a drive and motivation. The progress bars, points, badges and levels, allow users to see their progress and evaluate it. This is an example of the third element, the feedback tool. The leaderboard, which displays a user's position relative to other users, creates a sense of competition which is another motivator. Moreover, awards can make participants follow a different path. For example, loyalty programs can make buyers buy from a single vendor to maximize their rewards (Xu, 2012: 2). The rewards can be virtual. Gamification increases virtual interaction between participants; this interaction allows users to follow up with each other and encourage each other until the tasks are accomplished. (Alabbasi, 2017: 181; Can & Dursun, 2019: 121)

Hence motivation seems to go hand in hand with gamification. Theories of motivation such as the famous Taxonomy of Intrinsic Motivation split motivation into two types. Motivation is either intrinsic or extrinsic. Intrinsic motivation is motivation that comes from within; it is when an individual does a task because they find it to be personally rewarding. Extrinsic motivation, on the other hand, is doing a task for external rewards. However, motivation can be both intrinsic and extrinsic. An example of that is that a person can like their job, but they probably will not do it if they were not given a salary (Olsson, Mozelius, & Collin, 2015: 444). Extrinsic motivators that lead to activities that are initially intrinsically motivated are very beneficial. A user usually enters a gamified atmosphere willingly for intrinsic purposes, such as gaining knowledge, and due to the gamification their motivation increases extrinsically (Alabassi, 2017: 181).

Adding to the significance of gamification and its motivation, Fogg's Behavior Model (FBM) illustrates the idea of persuasive technology. Fogg's behaviour model focuses on factors that trigger certain behaviors, which makes it highly applicable in any cases concerning human computer interaction. The three main constituents of the model are motivation, ability and triggers, which if occurring at the same time can result in producing the target behavior (de Los Arcos et al., 2017: 129; Muntean, 2011: 324).

Motivators, regardless of their nature, positive or negative, will encourage a subject to complete an assigned task. An example of that is a student who has sufficient knowledge to solve a problem, yet they lack the motivation. When not solving that problem threatens that student's grades they are provided with the motivation needed to solve the problem. Ability is the second factor in the model. A person can be motivated to finish a task and be deficient in terms of ability, rendering them incapable of completing the task. Despite of that, with great motivation a person has the will to look for means to complete the task and by doing so gaining the ability they were previously bereft of. According to Fogg, motivation and ability without a trigger are still insufficient to determine a behavior. A trigger informs the user that now is the moment to perform the action. Gamification enables users to respond instantly to triggers (de los Arcos, Faems, Comas-Quinn, & Pulker, 2017: 129; Muntean, 2011: 324).

Furthermore, gamification is considered to be a highly convenient tool in education. In a study conducted by Chen et al. (2018: 51), out of eighty learners seventy-two percent claimed that gamification was either "highly useful" or "useful" to them in the comprehension and revision of elementary principles. In addition, eighty-two percent of them thought that it is worth the effort to implement competitive pedagogical games to enhance the learning experience in other courses. The findings of this study also confirm a previously mentioned advantage of gamification: motivation. Sixty-eight percent of the sample pledge that due to the games they were exposed to, they were more motivated, and, thus, performed better in exams.

2.1.2.2 Difficulties Faced With Gamification

As with most things, gamification comes with a price. On top of that, Alabbasi (2017: 186) states that thirty-two percent of a sample of undergraduates agreed that the sense of competition created via gamification has affected them adversely. They also argue that this led them to develop anxiety and discouraged them from creating friendships with their peers who they consider competitors, all resulting in a decline in academic performance (Alabbasi, 2018: 36; Panagiotis, Theodoros, Leinfellner, & Yasmine, 2016: 95).

Another argument claims that gamification serves as a distraction from the original cause. Thus, it is perceived as not always a successful method. Some teachers view gamification as a hindrance because it often results in a hurried response in an effort to receive a badge (Alabbasi, 2017: 191). They add that contributions to the community do not merit the receipt of badges; they should be done out of selfless attitudes, but gamification eliminates that (de los Arcos et al., 2017: 134). According to one study, gamified techniques were found to be less motivating than their non-gamified counterparts. However, these results stand in contradiction with other peer reviewed research papers mentioned by the same author. Additionally, the author states that the sample students seemed indecisive regarding the convenience, gratification, advantages and ease of use of the activities that had been gamified (Alabbasi, 2017: 182).

Furthermore, the development of games is an expensive process (Muntean, 2011: 323). The design of gamification is not intuitive. Gamification is inspired by games. Games are complex and multidimensional. Consequently, the transfer of a game into a holistic environment is not an easy process. In addition, in order to meet motivational expectations, the designer needs to have, in their capacity, a degree of understanding of human motivation psychology. Not to mention, another layer of understanding is required to achieve the main goal of gamification, which is to affect the behavior of the user. As a result, poorly designed gamified environment is condemned to failure (Morschheuser, Hamari, Werder, & Abe, 2017: 1298).

2.1.3 Most Common Gamification Methods

Gamification needs to built on certain mechanics to achieve positive results. The Self-Determination Theory discusses the drive behind decisions a person makes willingly without external intervention or pressure. This theory is used to define the basic requirements of a gamified environment and hence its methods. Gamification methods should build on three main principles: relatedness, competence and autonomy (Ling, 2018: 142). Consequently, gamification should consider the need of humans to interact and bond with one another. It needs to include the universal desire to master a problem in certain conditions. Finally, autonomy is the universal need to be able to make decisions independently (Olsson et al., 2015: 444; Panagiotis

et al., 2016: 95) . The following section discusses methods that are in line with the Self-Determination Theory.

Some of the less complex yet most common methods have already been mentioned in this paper, including badges, leaderboards, points, goals, feedback, rewards, experience, achievements, profile, difficulty, challenges, level, progress bars and virtual goods (Chen et al., 2018: 42). Another game mechanic employed in gamification is the use of avatars. Avatars are representations of characters usually in video games. Their presence in gamified applications helps in storytelling and visualising other members of the community, which increases socialization and enhances competition. As the user goes on to different levels, new avatars appear representing new characters and the evolution of the user throughout the gamified experience. Countdown clocks are used as well to motivate users to accomplish tasks quickly (Dicheva et al., 2015: 4-5).

Consequently, these game mechanics are used to apply certain design principles. In order for the goal of the application to be met, the game mechanic of goals and aims is used. Customization is permitted via personalized experiences, adaptive difficulty; challenges that are specifically designed to the user's level, increasing the difficulty as the player expands their skillsets. Points, progress bars and levels provide the player with a visible progression to mastery. Immediate feedback is provided via rewards like points and virtual goods. Points and leaderboards also offer an accrual grading system and a visible status among peers; reputation, recognition and social credibility (Dicheva et al., 2015: 4-5). Some features need certain badges to be unlocked. A user should be encouraged to participate and hence there needs to be a low risk from submission, and multiple attempts should be permitted. This grants the player the freedom to fail. Likewise, freedom of choice is of importance. A gamified application in which there are multiple routes to success achieves that (Chen et al., 2018: 42-43; Muntean, 2011: 325-327).

2.2 E-learning Overview

From birth, humans start learning, continuously. Over the years learning has taken many forms, in attempts to make the learning steeper (Cross, 2004: 103). The latest styles of learning form new challenges for the industry. The speed with which things operate nowadays, necessitates that individuals gain knowledge as fast as possible. E-learning enables that. Courses are available online and students can enroll upon demand. It has become a trending tool over the past few decades (Alsultanny, 2006: 111; Frydenberg, 2002: 1-2). This chapter discusses the definition of e-learning, its success factors, as well as its barriers.

2.2.1 Definition of E-learning

There is a common misconception that e-learning is the same as distance learning and open learning among others. E-learning is more than just a form of distance education. This generates due to a lack of understanding of what e-learning is (Georgiou, 2018: 205). It can be referred to as electronic learning or web-based learning. Since the inception of the idea of e-learning, scholars have developed various definitions for the word; most of them with added-value (Cross, 2004: 104).

According to Alsultanny (2006: 111), "e-Learning is just-in-time education integrated with high velocity value chains. It is the delivery of individualised, comprehensive, dynamic learning content in real time, aiding the development of communities of knowledge, linking learners and practitioners with experts". In other words, e-learning is a learning tool that comes with a well-needed feature; it enables the obtainment of knowledge or education, instantaneously, upon demand, regardless of the place or availability of other knowledge-seekers. In addition, Georgiou (2018: 205) defined e-learning as education provided through an internet-enabled software that is formulated to allow instruction and learning in an educational setting. Moreover, e-learning is education that uses web-based, web-distributed or web-capable technological tools (Nichols, 2003: 1).

Contrary to previous definitions, Cross (2004: 104-105) takes on a different intriguing approach when defining e-learning. According to Cross, human knowledge about how our minds learn is very limited. We know how the synapse, neuron and cortex, which are all parts of the brain, are good at naming and categorising. All the same, the mystery remains: there are only theories and assumptions when it comes to how all of these parts work together to compose the learning process. In more practical terms, learning, simply put, is a series of corrective actions that keep one heading in the desired direction. As for e-learning, it is defined for two different time frames. In the older version in 1999, e-learning was internet-based learning. The newer version claims that e-learning is hypothetically all learning. This is explained by arguing that in a world that can be called an e-world, the availability of networks expedites learning of all sorts.

2.2.2 Determinants of Effective E-learning

Advocates of e-learning are increasingly being asked to provide some form of proof that their learning and development initiative is truly advantageous to the concerned field or industry. This has triggered the interest of researchers, who assigned themselves the task of identifying an assortment of methods that define the effectiveness of e-learning. The effectiveness of e-learning is measured in multiple manners (Noesgaard & Ørngreen, 2015: 278). The most common way of evaluating e-learning's effectiveness is via measuring the learning outcome. This measure is used with higher education more frequently than its applications in work-related learning (Alabassi, 2017: 184).

Further methods include measuring transfer or the applicability of what is learned in real life practices, as well as perceived learning, skills or competency. Transfer is the most common evaluative measure when it comes to work-related learning with 38% of papers using it as a definition, because the ability to apply what has been learned is all that matters to the employer. Learning outcome is a vague term. However, the intended definition is how much the learner acquired; it is a comparison between the pre-tests, post-tests (final examinations) and the final grade letter. By coding and adding different weights to different factors, the effectiveness of e-learning can be computed (Noesgaard & Ørngreen, 2015: 281-282)

More simplistically, the constructiveness of e-learning can be determined through the usage of surveys, questionnaires, and interviews among others. By plainly asking the e-learner what they think of the learning experience in question and how they will appraise it, results can be accumulated to help evaluate its level of efficacy. Nevertheless, this is not limited to the e-learners' thoughts and opinions. The input of the course instructor(s) is taken as well (Olsson et al., 2015; 451-452). On a more specific note, users are asked to evaluate their pedagogy using survey tools like Likert's five-point scale (ranging from strongly agree to strongly disagree). In addition, the reliability of the survey itself can be measured using Chronback's alpha; the higher the better (Alabassi, 2017: 184). The prerequisites for effective e-learning involve customization of content, relevance and it being context-sensitive (Alsultanny, 2006: 117).

2.2.3 Barriers of E-learning

In the traditional method of teaching, a lecturer stands in front of a class and delivers content, while students listen and take notes, the approach is teacher-centered. E-learning, on the other hand, is student centered (Gambari et al., 2017: 25). Even though e-learning permits distance learning, enables visual and audio content, and encourages lifelong learning, it still has its drawbacks (Georgiou, 2018: 205; Mtebe & Raphael, 2018: 164). What with learners and instructors being in different locations, accessing content at different times, and progressing independently, a lot can go awry (Frydenberg 2002: 2).

2.2.3.1 Lack of Motivation and Limited Community Involvement

In e-learning and distance learning, learners miss out on the usual group of friends that can be made in traditional learning. They have no known cohort group with whom they can share ideas, questions, and jokes (Frydenberg 2002: 2). E-learning with limited interactivity can result in learners' boredom. Hence, leading to a lack of motivation, which is key to effectiveness. Learners need to interact with not just their peers, but also their teachers (Noesgaard & Ørngreen, 2015: 286).

Further factors that lead to demotivation include a previous bad experience with e-learning. Although, one should not generalize, some people tend to do just that; one negative trial of e-learning means that all e-learning is of poor quality, or they simply assume that they are not cut out for online learning at all (Frydenberg 2002: 2). Also, users often complain that courses are boring, rigid and with irrelevant content. However, to be just, the same is frequently said regarding education in general (Cross, 2004: 108).

On another spectrum, e-learning does not teach students the life skills that are taken for granted in traditional schooling systems. Developing relationships, talking in front of class, community norms, and socialization in general are among those skills. There are no assemblies to attend, no school plays, sports activities, shared lunches, or civic engagement (Georgiou, 2018: 207) Consequently, youngsters relying solely on e-learning might feel isolated and disconnected from their society (Noesgaard & Ørngreen, 2015: 286).

2.2.3.2 Financing E-Learning Programs

A very common mistake when it comes to planning for an e-learning program is lack of proper financial planning (Frydenberg, 2002: 7). The enthusiasm often makes the developers neglect the fact that the bill will arrive at one point or another. Sometimes, they are under the illusion that this course or program will be in the market for years; to be sold again and again with little maintenance costs. Additionally, misinformed individuals assume that the cost of one pedagogue can be spread over numerous students who did not qualify for scholarships. They view this as an application of economies of scale in the education market (Cross, 2004: 109).

Notwithstanding, e-learning, like other educational programs, has fixed costs as well as variable costs. Not only do they incur regular costs, but also, economies of scale do not necessarily apply to e-learning programs. E-learning universities were disappointed to realise that costs per course are not in an inversely proportional relationship with the number of e-courses being developed. As a remedy for that, e-learning universities are licensing courses and outsourcing licensed courses. This gives them time to focus on the main aim of universities: innovation. Additionally, this achieves the main objective of e-course applications: sharing knowledge (Muntean, 2011:

327). Mundane courses are bought and new interesting ones, that add value to the existing set of courses are developed by the university. This also grants them income from the e-learning programs they license (Alsultanny, 2006; 113-114; Frydenberg 2002: 7-8).

2.2.3.3 Others

There are plenty of other factors hurdling e-learning. Pedagogues themselves can be e-learning barriers. An instructor can have limited training in the delivery of e-learning material. They might even have too little knowledge on how to utilize the technology tools that enhance the experience (Chen et al., 2018: 42). In developing countries, e-learning is especially useful. Seekers of education might not find the guidance they need locally. Thus, e-learning is their chance; enabling them to acquire the desired knowledge and compete globally. Unfortunately, poor internet access becomes a barrier for them (Gambari et al., 2017: 26; Mtebe & Raphael, 2018: 163).

Furthermore, more and more government regulations are being made for e-learning. In order for courses to be accredited, they need to adhere to a set of quality standards placed by multiple accreditation agencies and schools as well as federal laws applicable in each region. In some cases, the law treats e-learning as a method of education directed at individuals with disabilities. These regulations encourage inclusion. For example, they set in their requirements that both audio and visual content are to be used; subtitles or visual explanations of any audio files for individuals with hearing impairment and descriptive audio files to help people with visual impairment imagine any visual simulations. Meeting these standards puts an extra strain on developers of electronic courses (Frydenberg 2002: 9).

2.3 Improving E-learning via Gamification

As previously discussed, gamification has numerous applications in which it enhances the user's experience and engages them more. As implied from gamification's definition, theoretically speaking, it is in the capacity of any task or operation to be gamified (Muntean, 2011: 323). This chapter focuses on the effect of gamification on e-learning. It first talks about how gamification helps e-learners overcome some of the obstacles faced in traditional e-learning. Secondly, it

throws focus on appropriate designs for gamification in e-learning. Last but not least, it considers the effect of gamified learning on the results of learners.

2.3.1 Ways in Which Gamification Helps E-learners Overcome E-learning Barriers

The aim of incorporating elements of games in e-learning is to better the e-learning experience by increasing motivation, socialization and speeding up the delivery of feedback. Additionally, the online learners can understand topics more easily with the use of game mechanics just like the utility of games in the traditional classroom setting (Ling, 2018: 141-142). It, also, makes the learning process more customized building a sense of ownership for the student. (Muntean, 2011: 323).

2.3.1.1 Gamification as a Technology Instructor

Gamification is a great teacher. The gamified atmosphere can help students understand content better and increase knowledge acquisition (Alabassi, 2017: 181). Olsson et al. (2015: 444-445) claim that the use of animated visual models of information makes it more memorable. This can be applied in programming education. Instead of giving the students a document with a written description of the expected outcome, they are given a visual representation of it. Advantages of this are that the students are left with more room for differentiation when it comes to writing down the code; they can use any approach that leads to this output. Hence, they grasp the concepts of procedural algorithms properly.

In addition, gamification increases a learner's attention span. In gamified e-learning, they need to be able to tell the difference between distracting game dynamics and the actual objective of the electronic learning program. Intellectual development is further strengthened by computer games and by the encitement of e-learning to accept oneself. Home-based learning has a positive effect on the overall cognitive abilities of the students. It is more visual than oral and a student's knowledge retention is doubled with the application of gamification (Alabassi, 2017: 182; Alabassi, 2018: 34). Gamification clarifies instructions and helps learners reach their potential by finishing tasks on a time limit and varying difficulties depending on the user (Muntean, 2011: 325).

2.3.1.2 E-Learners' Motivation and Elimination of Boredom

One limitation of traditional e-learning is that an e-learning instructor cannot engage the learner as a traditional educator could. The recipient is not capable of sharing their passion about the subject matter with their teacher, as they can in a physical classroom environment. The shortage of sentiments conveyed in e-learning needs to be compensated. Gamification does that by simulating learners with other means. Again, we refer to Fogg's Behavioral Model and its three elements: motivation, ability and triggers (de los Arcos et al., 2017: 129). In order for a student to learn properly they need to be in a state of concentration; the higher the level of concentration the better. Game mechanics, like scoreboards and badges grant the learner the desired motivation. The ability is taught in the content of the course and the trigger is gamified. Triggers can be achieved with stopwatches, promised rewards and/or levels that need to be unlocked (de los Arcos et al., 2017: 129; Muntean, 2011: 323-324).

Feedback tools include experience points and badges. Experience scores are derived from experience points and are used to develop leaderboards. Leaderboards allow learners to view their ranking among their peers at that very moment and to monitor their progress relative to their colleagues (Dicheva et al., 2015: 4-5). In addition, since goals are clear in games, gamified e-learning makes the objective of the e-learning process clear throughout all levels. As a result, e-learners have a drive that keeps them going. In gamified e-learning, each learner has a user profile, which can be visited by instructors and fellow learners. It is in the nature of homo sapiens to be competitive and wish to excel. Consequently, users strive to make their profile attractive with many badges and achievements. (Can & Dursan, 2019: 121-122).

As mentioned in the first chapter, Kaufmann (2018: 126) claims that one of the four basic elements that need to be present in games is voluntary participation. Nonetheless, critics argue that e-learning does not always involve voluntary participation. Although, the student may enroll in an e-course voluntarily, that does not entail that they wish to do all of its assignments. Here comes the role of gamification: providing the learner with sufficient incentives and motivators to complete assignments. The incentives in question are both intrinsic and extrinsic. Commonly,

intrinsic motivation would not need gamification, yet in the situation of e-learning, gamification can help the student recognise the added-value from finishing an assignment, increasing their intrinsic motivation. Moreover, it reduces stress. When one wishes to escape reality they go for games, another activity, or even a responsibility to avoid the problem at hand. Therefore, gamification makes e-learning a way for students to release their tension, which is not the norm in customary e-learning (Kaufmann, 2018: 126).

2.3.1.3 Gamification Increases Social Interaction

Moreover, gamification affects the psychology of learners. Students who experienced gamification were more willing to attend group meetings and mix up with others. Even further, undergraduates in this research paper, claim that with game dynamics they interacted more with their colleagues and received positive feedback as well as useful critique. Seventy-three percent of undergraduates in the study agreed that it increases their sense of belonging in the community. More than two thirds confirmed that gamification eliminated the feeling of loneliness they associate with traditional e-learning methods. An even larger portion thought that gamification deleted the perception they had of e-learning as difficult and attributed to social isolation (Alabassi, 2017: 181-182). The addition of elements of games to e-learning increases collaboration between students amongst themselves and with teachers (Alabassi, 2018: 34-35).

2.3.2 Gamification Design Approaches Suitable For E-learning

Designing gamified online courses is complicated. The idea is that it is not a game being designed, rather a course with some game mechanics incorporated in it (Alabassi, 2017: 181). On the bright side, electronic courses usually have linear structures which makes the addition of game features in them an easier job (Muntean, 2011: 326-327). Some researchers claim that game mechanics, like badges, points and leaderboards, can be used as building blocks for the design of gamified courses. This is called Gamification 1.0 (Morschheuser et al., 2017: 1300; Xu, 2011: 11).

Another concept in the design is the four keys to fun: hard fun, easy fun, serious fun, and people fun. The majority of enjoyable gamified e-learning courses have three of the four keys. Hence, it is hypothesized that incorporating all keys will output a highly enjoyable experience. Smart gamification's purpose it to design the user's journey where intrinsic rewards are held at a higher value than extrinsic rewards (Xu, 2011; 11-12). This ensures that learners always remember that their main goal, at the end of the day, is learning (de los Arcos et al., 2017: 134).

A common mistake made in numerous articles was to put too much emphasis on understanding the user and neglect the significance of the underlying system itself (Xu, 2011: 9). All the same, analysing the user is important. Interviews, observation, and focus groups are amongst the tools that are commonly used to collect data on users. A method to analyse user and context together is the activity-challenge-motivation triplet. Given certain circumstances, this method generates challenges and the motives behind the users' actions. The steps in the creation of gamified courses start with the generation of ideas. Next is the design of models or prototypes, followed by the creation of prototypes in the form of sketches or wireframes. These models are then evaluated. If accepted the development phase is planned (Morschheuser et al., 2017: 1300-1303).

2.3.3 The Effect of Gamification on E-Learners' Results

In a study, data was retrieved from interviews , focus groups, and experience activities, qualitative data was used to reach an in-depth understanding of the results. According to this qualitative study's results motivation was at its highest when the e-learning process was gamified. (Can & Dursan, 2019: 130). In another study conducted by Ling (2018: 148-150), students were given a questionnaire and were asked to rate intrinsic motivation from 1 to 7 with 1 being the lowest and 7 the highest. In this study, there were factors affecting the experiment of gamification in e-learning for 1 week. Students were obliged to download the game and there were technical issues; in some cases download took up to five hours. All the same, quantitative results were positive. Interest/enjoyment, perceived competence, and perceived choice were each given an average of 4.564, 3.763, and 4.076 respectively. Pressure/tension were given a 2.326 out of 7, which means that overall pressure felt from the competitive atmosphere was not high. Qualitative results showed that students mainly found it to be "engaging" and "fun".

Furthermore, in another paper, most students agreed that they prefer badges to grades. However, some students thought the badges irrelevant and disturbing. When asked about the progress bars incorporated in the course, students replied that progress bars made it easier for them to know how they did on assignments. Albeit, to the developers dismay, they added that if the goal of progress bars was to create a game feeling then it failed to do so. University professors were of a different opinion. They were glad to be able to see participants' progress. If participation decreased, they were made aware, enabling them to remedy the situation before it became out of hand (Olsson et al., 2015: 451).

Muntean (2011, 328) concluded that gamification adds an aspect of fun to e-learning. It gives them an incentive to accomplish assignments; it gives them a drive to learn more. The feeling of anticipation guarantees long-term motivation; the user is keen to know what happens next, what levels are they unlocking and so on. It increases student engagement and promotes positive behavior. Further still, it improves the learner's cognitive functions considerably and triggers the mind to consider different approaches to the same result.

2.4 Research Gap

From exploring the previous literature review, a research gap has been identified. There was no research dedicated to studying the relationship between gamified e-learning and women empowerment. In developing countries, where women are not given the right to education, electronic learning from home can be their sole window to learning. However, the barriers to e-learning might act as constraints. Thus, gamification can be a game changer. Incorporating them into knowledge societies and delivering information in an entertaining manner. Therefore, the research question that this paper aims to answer is: "What is the effect of the application of gamification in e-learning on women empowerment, in developing countries?"

Hypothesis: Gamified e-learning has a positive effect on women empowerment, in third world countries.

3. Methodology

Method and Description

The research, in this scenario, is an explanatory causal research as it discusses the effect of an independent variable on its dependent counterpart (Cooper & Schindler, 2014: 56). It is quantitative research as it gathers quantifiable data (Cooper & Schindler, 2014: 146). The main method used is design science. Generally speaking, design science is a method that focuses on the development of an artifact that improves the functionality of that artifact in one way or another (Cheong, Cheong, & Filippou, 2013: 2). Accordingly, a series of gamified e-learning courses were designed with the aim of empowering women living in developing countries. These electronic courses form an undergraduate program.

Another research method applied is observation. Observation is considered as an approved scientific technique when it is applied to answer a research question (Cooper & Schindler, 2014: 172). Furthermore, a topic like gamification enables observation given that user data and progress are readily available on the system. An example of a paper applying that is a research that was conducted by Chen et al. (2018: 49). It used observation, in the study on gamifying online courses, to reach conclusions about how exam results were affected.

Background Information About the Variables

From the research question, the concept of gamified e-learning is the presumed cause, independent variable, of the focus and gap of this explanatory research. The presumed effect, also known as the dependent variable, is women empowerment. Both concepts will be measured throughout the study. Presumably, any positive or negative changes in the independent variable will affect the dependant variable, whether directly or inversely (Cooper & Schindler, 2014: 55).

Gamified e-learning is, as previously defined, the use of game elements in e-learning. There is a control experiment with traditional e-learning. Hence, our measure of gamification in e-learning is binary: either there or not. Women empowerment is used to describe numerous aspects of a

female specimen's life. Thus, this paper goes by a specific definition for the term. Women empowerment is the social position given to them and their access to education (Deb, Kabir, & Kawsar, 2011: 401; Moghadam & Senftova, 2005: 391). More specifically, this research paper focuses on their access to education. As such, this study measures women empowerment as the ratio of undergraduate women to men in a certain region.

Instrument Design

Design science emphasizes the connection between knowledge and practice due to the fact that scientific knowledge can be acquired by designing relevant artifacts that help in solving problems (Cheong, Cheong, & Filippou, 2013: 4-5). Pfeffers et al. (2006: 87) defines design science research as six steps. The first step is programming and its purpose is to emphasize the purpose of said research. Furthermore, this puts an emphasis on problem identification, which includes defining the problem and explaining the added value of solving it. Data collection and analysis form the second step. In the third step, objectives and analysis results are integrated. The fourth step is quite integral as it involves the formulation of improved design proposals. It is the development phase. Design and development involve the creation of the artifact that will aid in finding a solution. It includes defining the functionalities of said artifact and then putting the design into action. Prototyping is the fifth step and the final step is the documentation of results in scholarly journals. Documentation is how the results are communicated to whomever they may concern, regardless of their level of technological orientation. The evaluation is a demonstration of how effective the constructed artifact is in the provision of a solution (Pfeffers et al., 2006: 90-92).

In addition, this paper uses observation for the evaluation of results. Observation is, normally, qualitative (Cooper & Schindler, 2014: 144). However, that depends on the context and how observation is performed. In this case, observation is in the form of quantitative record analysis (Cooper & Schindler, 2014: 165).

Sampling

Four different countries were chosen: Bangladesh, Eritrea, Malawi, and Somalia. What these countries have in common is that they are all developing countries and that all of them have internet access. Two regions or villages were chosen from each country, such that said region had the average level of women empowerment in that country. An example of that is Chittagong in Bangladesh (Deb et al., 2011: 408). From each of those regions, a sample of 100 women were selected via snowball sampling, resulting in an overall sample population of 800 women. This nonprobability sampling method was preferred due to the nature of this study; women, willing to invest time for the sake of their self-development, would recommend acquaintances with the same desire (Cooper & Schindler, 2014: 152).

The sample population consists of females, which are all unemployed. In addition, their ages from 20 to 35 years old and either married or single. The sample has women who are mothers and those who are not. Consequently, this diversity allows us to compare how the responsibilities of motherhood and/or being married affect the results. The sample will include women who can read and write and have the prerequisite knowledge for the gamified e-learning program.

Procedure

In developing countries and especially in small villages, the problem of limited women empowerment and their deprivation of basic rights such as access to education is evident. This is measured by the mean years spent in education. Information regarding that was collected from pre-existing school records. The number of girls who went on to become university students was also provided by schools. All data was anonymous, protecting the confidentiality of the schools' ex-students.

There are two similar undergraduate e-learning programs designed for this paper; one that is gamified and one that is not. The control experiment uses the traditional e-learning program and distributes it on half of the sample; 100 women from a village in each country. On the other hand, the gamified program is given to the other half. It is ensured that the subjects all have

laptops or any other computer device that can be used to enroll in the program, as well as sufficient internet access from their homes.

The e-learning programs were designed so that preliminary knowledge was not too demanding. This is not the normal scenario of applying to a university program with high competition. What was expected from participants was to show dedication and knowledge equivalent to that of a below average high-schooler or above. In fact, the first e-learning courses in the program were designed to ensure that all participants had adequate knowledge for the remaining levels. The program was provided for free and participants were assured that they will not be charged even if they did not complete the course. Demographic information, such as name, age and marital status, was collected from the very beginning when the subjects first logged in on the system. Accordingly, data confidentiality was ensured prior to the request of any personal data.

Execution of the methodology was carried out in a period of two years, giving the sample sufficient time to complete the undergraduate program in its official duration of two years. In an effort to evaluate the effectiveness of gamified e-learning in the empowerment of these women, the results of those with gamified e-learning were compared to the control group to determine the difference that game elements created in the results, if any.   Using observation, statistics were made to count the number of women in both experiments who completed the course. Moreover, ratios were calculated comparing the percentage of graduates in the small villages before and after the experiment was conducted, using the data provided by schools and the new data from the e-learning program. In addition, the average performance of females in the control experiment was compared with the average performance in the gamified experience. Information regarding the completion of the course and the performance of the students were all readily available on the e-learning system. Research findings are communicated with interested parties as published articles in scholarly journals.

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