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# GAMIFICATION AND LEARNING: ENHANCING AND ENGAGING E-LEARNING EXPERIENCE

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**ABSTRACT:** Gamification applies the game elements and digital game design techniques to non-game problems such as business and social impact challenges. This concept has received increased attention and interest in academia and practice, and the education sector has emerged among the main areas of research concerning gamification. With limited research on gamification in learning, this study: 1) evaluated the theoretical background supporting the application of gamification in the education sector, 2) reviewed gamification frameworks and structures applicable in learning engagement and enhancement, and 3) finally discussed the potential benefits of gamification in the learning experience and e-learning. The study is hinged theoretically on the Theory of Gamified Learning, which advocates that gamification should target behaviors or attitudes that affect learning and target behavior or attitude that makes existing instructions more effective. It emphasized that the structure and framework should consider applying several principles such as the accomplishment principle, reinforcement principle, competition principle, and fun-oriented principle of gamification. Some elements should be included in the game for it to function properly; these include input, processing, and output. The benefits of gamification in education and learning experience include an increase in learners' engagement, making learning fun and interactive, improving the learners' knowledge, absorption, and retention gives the learners an opportunity of seeing real-world applications. It also gives learners an opportunity of learning at their pace, enhancing the learning experience for people of all age groups, as well as application of the learning beyond the classroom.

**KEYWORDS:** *Gamification, game-based techniques, learning experience, eLearning*

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## 1. INTRODUCTION

Gamification is a new concept that implies the application of the game elements and digital game design techniques to non-game problems such as business and social impact challenges. Kapp (2013) clarifies that gamification implies the application of game-based techniques, thinking, and aesthetics

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to engage, motivate specific actions, promote learning activities, and solve problems. This concept has received increased attention and interest in academia and practice, and the education sector has emerged among the main areas of research about gamification (Dichev & Dicheva 2017; Dichev et al., 2014; Hamari et al. 2014). Gamification is the conscientious extraction of the basic principles of games premised on the assumption of an educational experience that can be redesigned and structured on these principles. Four tools are used often in the gamification process, they are collectively referred to as "the Four Freedoms of Play." The first tool is the 'freedom to fail', which allows the player to make errors following up with little consequences. The second is the 'freedom of experiment' which allows players to search, discover new strategies, and together moderately piece the information. The third one is the 'freedom to assume' different identities, which concentrates on inspiring the player to observe problems from different perspectives. The fourth one is the 'freedom of effort', which lets the player go through several intense activities and inactive activities and not feel too blunt (Lee & Hammer, 2011). In the implementation of gamification, the system requires strength in both time and money with organized support beyond the first attempt to take gamification from a trial concept into a real platform. For learning purposes, appropriate instruments should be chosen for the class targeting the right students which is often the most difficult part, suitable instruments must be selected. In this research, the research attempts to explore three objectives, which are related to three research questions. These objectives include:

- a:* To determine the theoretical background supporting the applicable in learning engagement and enhancement
- b:* To evaluate the gamification frameworks and structures applicable in learning engagement and enhancement
- c:* To discuss the potential benefits that of gamification in the learning experience and e-learning

According to Gnauk et al. (2012), the main objective of gamification is to directly affect the attitudes and behaviors, which are relevant and directly influence the learning activities. These behaviors are attitudes, which consequently influence the instructional and learning content given or accessed by the students, and the resultant learning outcome. This is achieved through the moderation and mediation aspect, which is dependent on the nature of the specific learning behaviors and attitudes that are targeted by the gamification process or exercise (Fu, 2011).

## **2. GAMIFICATION IN LEARNING**

The application of game and game-like elements has been increasingly applied in various domains of the real world, ranging from marketing to health and fitness. Gamification is utilized currently in the promotion of businesses, products, wellness, and political candidates. For instance, many products have applied games to promote their goods and services. Corporate organizations have also utilized games to encourage people to stay fit. In the education sector, gamification is viewed as gamified learning (Armstrong & Landers 2017; Swacha, 2015; Landers, 2014). It generally refers to the addition of gaming elements in the learning process, to change the existing learning process. Though it has been considered a suitable concept that enhances learning, and particularly e-learning engagement, gamification remains a challenge in its ability to fully engage the students in their classroom-based activities. However, it is critical to consider that computer games perform well in engaging the students. Therefore, it is a great idea for educational sectors and educational institutions to start thinking and consider how computer games, or rather, the concept of

*Global Journal of Entrepreneurship and Management – Volume 1, Issue 1*

gamification could be applied to enhance educational activities. Kapp (2013) postulates that computer games, if designed appropriately have a great potential to keep the learners and students engaged, with potentially difficult and complicated tasks and assignments. Therefore, gamification is a great resource for helping students to achieve a clear actionable task, and promise them immediate rewards, as compared to the vague long-term benefits, which are not predictable. As a result, by applying gamification, students can learn from their mistakes, while at the same time applying their negative experiences and failures in a meaningful and positive manner.

Kim et al. (2018) also add that gamification has increased the ability of the physical world if the right elements are used in the correct settings. It also has the potential to bring significant improvement in everyday behaviors, which in itself is a very effective activity. In the learning process, the participatory process that contributes to behavioral improvement is an achievement in itself. Some think that gamification is competitive and innovative and believe possesses endless possibilities in its applications. Games and game-like elements have entered diverse real-world contexts like marketing, politics, education, and fitness. Gamification could be applied in various areas, such as promoting a company, a commodity, a public official, or healthcare. For example, advert games were used by marketers to incorporate ads into games to actively promote their goods and services and some business works with third-party. A popular game like Candy Crush allows ads embedded within the game. Players receive rewards for viewing marketing messages from different businesses and groups. Gamification aims to leverage and apply the level of motivation of games to real-world challenges, students' motivational content among other areas. Applying gamification in the educational modern context may help improve academic achievement for the students.

According to Lee and Hammer (2011), schools have used game likes features in classroom practices, such as awarding students points to prioritize tasks; these points have in instances been converted into grades. Utilizing such a reward system, students are motivated to act in behaviors that come with a potential reward, and mentally sanctioned for inappropriate behavior. At the end of each school year, students are in a position to perform well. Although making an effort to use gamification in colleges, students in classroom-based activities remain difficult to communicate entirely. Yet gaming stands out as a guarantee. Institutions of higher learning are also interested in learning, how education can be achieved by games. In line with the first objective of this research, there are several theories and studies that evaluate the aspect of gamification in the education sector. One of such theories is discussed in the following section.

### **3. THE THEORY OF GAMIFIED LEARNING**

The Theory of Gamified Learning has extensively explored the application of gamification in the learning context. It considers gamification as the process of linking the learning and research elements, in the context of gamification literature and serious games (Landers, 2014). It also presents the theoretical framework, which applies to gamification for the improvement of learning outcomes. The theory also presents a general model of psychological processes in which an aspect of gamification is applied to improve learning outcomes. The Theory of Gamified Learning implies that the process of gamification could influence education through two processes, hence influencing the process of decision-making when it comes to gamified learning activities (Landers, 2014). The theory advocates that instead of focusing on to 'get people to learn' notion, gamification should be targeting the learners' behaviors and attitudes. These processes are discussed further.

### 3.1 Gamification Should Target Behavior or Attitude That Affect Learning

This notion implies that gamification in learning should be focused on increasing the meta-cognition which in turn would increase the learning activities. An example of this is that the students who tend to take time, pause, and meditate on their content (meta-cognition) tend to learn more. The theory advocates effective gamification in education, which takes the same approach, follows the same idea (Landers, 2014). The main idea of this concept is that it encourages the learners to do the same thing they are aware of doing, in a faster and effective manner. Additionally, it encourages learners to try things that they consider to be difficult, complicated or could have been too afraid of doing them. This is based on the gamification motivational principles of the Theory of Gamified Learning, which indicates that learners should not be forced to participate in learning activities. Rather, gamification should focus on encouraging and recognizing behaviors, which are helpful in learning instead of being critical when they fail. The theory states that if an activity is critical to learning, then, it is not a game (Beño et al. 2015; Landers, 2014).

### 3.2 Gamification Can Target Behavior or Attitude That Makes Existing Instruction More Effective

This concept relies on the increase of the engagement of the learners. In learning, gamification, or rather games can increase learners' engagement (Landers, 2014). For instance, learning activities such as questions would be presented as a game, which would encourage students' participation, or encourage a thinking atmosphere that it would have otherwise engaged (Landers, 2014). Figure 1 illustrates how the game elements could be applied in the process of enhancing learning activities.

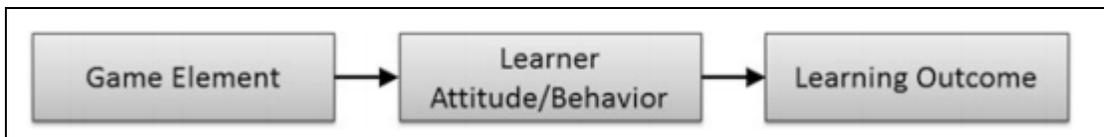


Figure 1: Game element and learning outcome Source: Landers (2014).

Figure 1 illustrates the causal path from the game element to the learning outcomes, where the game elements help in mediating the learners' attitude and behavior, to produce enhanced and improved learning outcomes. This model is adopted from the Theory of Gamified Learning (Landers, 2014).

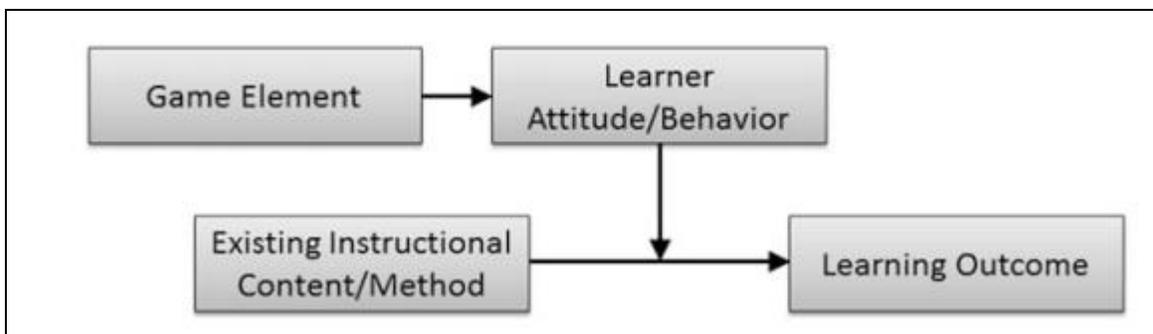


Figure 2: Game element, learner attitude/behavior, method, and learning outcome Source: Landers (2014).

Figure 2 illustrates the causal path from the game elements to the learning outcomes, which are mediated by the learners' attitude or behavior. The existing instructional contents and methods are mediated by the learners' attitude and behavior, which leads to improved learning outcomes. This model is adopted from the Theory of Gamified Learning (Landers, 2014).

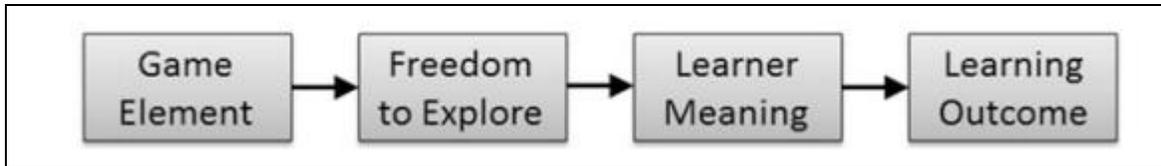


Figure 3: Causal path from game elements mediated by attitude/ behavior Source: Landers (2014).

Figure 3 shows the learning path from the game element to the learning outcome. The game element brings about the freedom to explore that generates the learner's meaning producing the intended outcome. This model is adopted from the Theory of Gamified Learning as discussed by Nicholson (2015). The Theory of Gamified Learning incorporates the game attributes that could be used in advancing and enhancing learning activities, the theories, and their specific application in the gamification theory. These are discussed in Table 1.

**Table 1: Game attributes, meaning and application**

Game attribute	Meaning	Gamification Application Example in Learning
Action language	This implies the interface or platform which facilitates the communication between the game and the player, learner of user	To use gaming applications such as console controllers, PlayStation controllers to participate in an online learning activity
Assessment	It is the process that is applied to track the game process, and its activities and accomplishments (Nicholson's, 2015).	In the learning process, it could imply a gaming system that is applied to identify or track correct and wrong answers received from the student as they tackle a particular learning activity.
Conflict/challenge	This implies the issue or problem that the user is focused on solving including the nature and hardness of the concerned problem	Gamification could be applied in developing group discussions for students, where each group should try and address the problem on its own
Control	This implies the extent to which the game player can alter it, and the extent to which the game itself could be altered (Nicholson's, 2015).	Applying gaming to structure small discussion groups, and make it in a manner that the decision made by each of these groups significantly influences the next topic that will be addressed by the concerned group
Environment	This implies the physical surrounding the player, and its representation	A good example would be the migration of a physical class meeting to a 3D virtual classroom or any other online platform
Game Fiction	The fictional storyline of the concerned game (Nicholson's, 2015)	This may involve changing the structure and names of the content to gaming-related names. For instance, lectures and discussions may be named adventures and discussions respectively.
Human Interaction	This implies the extent to which the gaming environment allows the different players to interact with each	An online learning system, where students could interact with each other, share materials and constant, and compare their performance and

	other and the concerned space and time	findings
Immersion	Implies the experience of the game that the user has all along (Nicholson's, 2015)	Could entail enhancing the experience of learners through projectors and wall screens where they could easily follow the learning progress
Rules or goals	This entails a clear statement and definition of the game rules, objectives, and information, and the consequential reporting of the progress of these goals (Nicholson's, 2015)	In online learning, the system has a clear description of the learning milestones, the time and requirements of these milestones, as well as the completion levels and time of these milestones

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## 4. GAMIFICATION FRAMEWORKS AND STRUCTURES APPLICABLE IN LEARNING ENGAGEMENT AND ENHANCEMENT

From a critical perspective and inferring from the findings of various researchers (Kapp, 2013; Fu, 2011; Hamari et al., 2014; Faiella & Ricciardi, 2015; Hanus & Fox, 2015; Simões et al., 2013), gamification has significant and positive implications on the education and learning experience. As a result, based on a literature search, this study has identified and developed a framework and structure that could be applied for enhancing learning engagement and enhancement. The framework is composed of five principles as discussed in the following sections.

### 4.1 Goals and Objective Principle

The process of integrating gamification technology in the learning process should be goal oriented (Monterrat et al., 2015). They must be structured in a manner that they can contain various layers of goals (Raymer, 2011). Specifically, the long-term goals of the learner could be considered the completion of an educational game. To achieve these long-term goals, the player (learner) would be required to complete medium-term goals involving the completion of the game levels. Consequently, to achieve medium-term goals, the player would be required to complete the short-term goals, involving the completion of the mission of each level. As learners achieve the goals and move up the ladder from the short-term goals towards the long-term goals, the challenge of the level of complication of the educational game increases. To ensure proper engagement of the learners (players), it is critical to strike a balance between their knowledge and skills, and the level of complication or challenges of the game (Apostol et al., 2013). Setting these layered goals is important as it allows the learners to progress systematically from the beginner to the expert levels, with a progressive mastery of the relevant knowledge and skills. More importantly, it is a critical technique for maintaining the engagement and motivation of learners.

### 4.2 Accomplishment Principle

This is the principle of recognizing the minimum achievements attained by a player or learner. Moncada and Moncada (2014) opine that the sense of gratification among the learners increases whenever their achievement is recognized. As a result, their levels of motivation and engagement are enhanced. Therefore, the accomplishment principle is critical in the gamification of education, as a strategy of increasing the learners' engagement and hence increasing the learning experience and achievement. There are various ways in which accomplishment could be recognized, such as ranks, star ratings, trophies, and awards.

### **4.3 Reinforcement Principle**

According to the behavioral learning model, reinforcement is a critical principle in the learning process, as it forms the basis on which the learning takes place. The reinforcement practices include verbal praises or compliments, or tangible or intangible rewards (Renaud & Wagoner, 2011). Therefore, in the application of gamification in education, it is vital to have a reinforcement principle, mounted on a reward structure, which is based on the performance of the learners and feedback mechanism. According to Yildirim (2017), in educational games, the positive reinforcement principle could be applied through the offering of gratification, virtual currency, and promotion of the learning activities through the game. At the same time, negative reinforcement is important as it could offer corrective information regarding knowledge and skills, which would help learners quickly and effectively achieve learning outcomes.

### **4.4 Competition Principle**

According to Liu et al. (2013) citing McGonigal (2011), players are motivated by intrinsic rewards and competitive engagement. Therefore, competition is a critical aspect as far as good outcome gamified learning is concerned. In the context of educational games, competition is considered vital as it helps in increasing or enhancing the engagement levels of the learning tasks. However, the competition principle should incorporate well-defined, explicit, and strictly enforced rules and regulations governing the competition procedure, which would focus on ensuring the sense of control (Agarwal & Karahanna, 2000), which would further enhance the levels of engagement. It is also a common concept that players, or rather learners, should be allowed to set their own goals, as a means of maintaining motivation and engagement as well as presenting an opportunity for learning activities. Rules generated by players are an active technique of discovery learning.

### **4.5 Fun Oriented Principle**

This principle is centered on ensuring that the players enjoy every bit of the game they play. The creation of fun and enjoyment within the gaming activity is heavily linked to high levels of engagement and cognitive absorption. If the player is experiencing a particular level of fun in the game, then there is a high probability that the player would be highly engaged with a task that they would have otherwise lost track of time (Agarwal & Karahanna, 2000). Fun creation is considered a critical element in computer games and their associated elements. Therefore, it is very important to have a fun component or orientation in the gamification of learning, as a means of motivating or engaging learners.

### **4.6 Gamification of Learning System Design Elements**

The overall experience and appropriateness of games depend on the system design elements, which are all designed to improve the user experience. Before the development of any game, the design mechanism should be clearly outlined. These are the elements, which together interact to create a new game. Some elements must be included in the game for it to function properly. These include input, processing, and output. The user is also required to have a proper check of the surrounding environment and boundaries, and the interaction taking place through the interface. The game also needs to have other elements referred to as the 'attractive' or 'magnetic' cues, which are vital in enticing players into the game, increasing their engagement to continue playing the game. These components, according to Konstantakopoulos et al. (2019) are considered critical in a game, as they help in the enhancement of the interest of players and make them meaningful.

Concerning the gamification of education, the interest of the learners should therefore be always in mind. For instance, considering a game such as 'the angry birds', it applies quite a simple concept. The aspect that makes people very attracted, or even addicted to the game is how the game is designed. It incorporates various components to entice the user. The game designer should be able to utilize the game mechanics, with an interest to increase the users' interest. While the outlying theme of the game should be kept as simple as possible, the soundtracks incorporated in the games should be attractive. These aspects should be keenly considered when developing a learning game.

Zichermann and Cunningham (2011) outline seven primary mechanics that should be considered while designing a game. These mechanics include points, levels, leaderboards, badges, onboarding, challenges/quests, and social engagements loops. In addition to these mechanics, there are aspects of a game, if, when incorporated into its systems helps to improve and enhance its engagement. These aspects include feedback, team and social dynamics, rules of the game (both explicit and player-generated), the marketplace, customization, narrative context, space, and sound, as well as the roleplay. Altogether, these game mechanics and aspects form the core system design, which should be considered as the major elements in the process of gamification of education.

Considering the specific components, points are the main components of the game mechanics, which are used to define and drive the goals of the game (Denny et al., 2018). The levels are used to highlight the progress towards the achievement of the main goals, from the low-level goals towards the intermediate goals. The leaderboard is a platform, which allows the comparison of performance among the game players, while the badges help indicate or recognize the achievements or accomplishments of a player. Onboarding is the process in which a novice or a newbie in the game is introduced and taken through the stages towards becoming an expert in the game through the acquisition of relevant skills and knowledge. Social engagement implies the loops, which helps in developing a continuous engagement of the users. The feedback is a critical system design component, which helps in reinforcing the system. It is recommended that fun components of the game such as avatars, customization, narrative context, and roleplay should be incorporated into the system, to increase engagement (Monterrat et al., 2013).

## **5. BENEFITS OF GAMIFICATION ON EDUCATION AND LEARNING EXPERIENCE**

### **5.1 Increases Learners' Engagement**

Gamification in learning has played a critical role in helping professionals to create enthusiastic experiences among students. Learning through games enables students to develop an interest in the gaming activities as they strive to reach a given goal in the game, and thereafter, are promoted to the next level of the game, or they will receive a reward for their ability to complete the current level successfully. Through this, gamification creates a positive learning environment that holds learners' attention and motivates them to give their best in the gaming activity and complete a given challenge successfully. The same is transferred to the learning process. The learners develop a positive attitude to their learning through gamification as they know they will receive their rewards if they complete a given learning activity. De-Marcos et al. (2017) assert that gamification enables learners to stop being passive learners' but motivates them to become active participants in the learning process. This enables the students to absorb the concepts effectively learn and commit them to their long-term memory because the entire learning process is connected to favorable experiences that the students experience through gamification in eLearning.

## **5.2 Makes Learning Fun and Interactive**

Gamification in eLearning brings the aspects of having fun in the learning process. Even though the eLearning process may have a wide variety of learning objectives and goals that students are to attain by learning the eLearning course, students cannot attain any of them effectively if they do not become excited in the learning process itself. Gamification plays a critical role in breaking the traditional way of learning in which instructors would take a central role in the learning process and instill concepts to the students. In such a setting, students would take passive roles and listen attentively to their instructors. Gamification in eLearning provides avenues through which students take active roles in the learning process by actively engaging themselves by playing a variety of games provided. Instructors provide the students with a variety of games in eLearning depending on the concepts that the instructors wish students to learn from a particular game. Students earn these concepts by having fun as they play the games and compete with one another in achieving the goals and objectives laid by each game. This creates an interactive element for learners as they develop a feeling of being integral parts of the overall learning experience (Domínguez et al., 2013).

Gamification in eLearning also enables learners to interact with one another as they are playing educative games. The interactive games enable them to move from one area to another and to engage themselves in physical activities. Literature on gamification have asserted that interactive gaming is good as physical exercises for learners who do not engage themselves in physical exercises to keep themselves physically fit (Filsecker & Hickey, 2014; Garris et al., 2002; Hu & Hui, 2012; Keller, 2016; McGonigal, 2011). Unlike video games in which the gamers sit in one location for a long time, most of the games involved in eLearning require users to shift their positions frequently; hence, they do not stay too inactive for a very long time. In addition, by interacting with others, the students learn the skill of teamwork in which they must work as a team in some games from them to complete given levels before advancing to more advanced levels successfully. Through this, the learners appreciate working with each other in achieving the corporate goal in which they are rewarded as a team. Learners can employ such skills later in their careers in which they are needed to work in a team with their co-workers to achieve corporate goals and objectives of the organizations they will be working for.

Gamification also improves learners' knowledge absorption and retention. Most games used in the eLearning blend endorphins and created awareness of real-world situations. Through this, the learners have fun at the same time learning about important concepts that they can apply in real life to solve problems. Gamification in eLearning is geared around compliance training that enables learners to capture given concepts embedded in the games while they are having fun. Considering that the learners will be having lively experiences as they are playing the games, they will actively learn the concepts that are embedded in the games with positive attitudes and more interesting ways. This will increase the ability of the learners' memories to hold these concepts in the long term. The learners can retrieve these concepts when they need them either in their examination rooms for passing tests or when there is a need to apply the learned concepts in solving real-life problems that they meet in their daily lives.

## **5.3 Gives learners Opportunity to Seeing Real World Applications**

Gamification in eLearning enables students to face the facts of life while they are young. In gaming, learners are only rewarded after completing a given level. These rewards would either involve giving certain points, bonuses, or even being promoted to the next level in the game that is

more complex and requires much thinking for one to complete it. This is what happens in life. One is only rewarded after completing a given task or after attaining a given level, be it in education or their future career lives. The choices mainly determine the ability to complete a given level in gamification that the learners make as they are playing the game (De-Marcos et al., 2017). The same is echoed in real life. The choices that learners will make in their real-world life have consequences about their future or ability to achieve given goals in their lives. Rozman and Donath (2019) contend that gamification in eLearning gives learners a first-hand look at the effects of their choices in achieving their goals in real life. If the learners make poor choices either in their education or in their daily lives, the consequences of their choices will hinder them from unleashing their full potential and becoming what their best in their careers.

#### **5.4 Gives Learners The Opportunity Of Learning On Their Pace**

Learners can only get rewards in gamification by completing a given level in the game they are given by their instructors. For learners to complete the level and receive a reward, which includes being promoted to the next level in the game, they must master the concepts that are embedded in the level fully they are playing. Depending on the learning pace of the learners, some learners finish one level and are quickly promoted to the next levels of the game which are more complicated and need them to learn new concepts that are involved in those levels to complete them. For slow learners, gamification gives them the opportunity of learning the concepts at their own pace before advancing to the next level (Bernik et al., 2014; Browne et al., 2014; Bedrule-Grigoruta & Rusua, 2014). Considering that each student will have their gaming devices, each student will play the games independently with little or no help from their colleagues who would have mastered the concept involved in each level. This would enable the students to learn the concepts by themselves, hence enabling them to be self-reliant and learn to do things by themselves.

Generally, all students successfully master a given concept involved in each level of the game before they are promoted to the next level in which they will develop on the concept they learned in the previous level, or they will learn entirely new concepts. Instructors will only step in to help when the students are experiencing tremendous trouble in completing a given level. By providing them with little assistance, the students will quickly catch up with other students who would have solved the challenges experienced at a given level (Kaufmann, 2018). Unlike the traditional classroom education in which instructors move with the majority in teaching concepts, hence leaving other learners behind, gamification in eLearning enable instructors to ensure that all students are on board before progressing to the next category of games that involve new concepts that the learners need to learn after fully mastering concepts in their previous category of games.

#### **5.5 Enhances Learning Experience For People From All Age Groups**

Gamification in eLearning brings in the aspect of having fun while learning important concepts that are critical in not only helping students to pass in their examinations but also in solving real-world problems that they encounter in their daily lives. Regardless of the age of the learner, whether a K-12 student or an adult learner, gamification enables the students to learn even to most dull or complicated concepts more easily and. Most game designers have come up with a way of integrating the necessary concepts that learners ought to learn even without knowing that they are learning such concepts. This makes knowledge absorption a by-product since most learners become focused on completing the levels and achieving the rewards that are set for them to receive after completing the given level. In the end, the learners accomplish most of the learning objectives and goals in each eLearning course even without knowing that they were learning important skills that will enable

them to pass in their examinations and solve real-world problems that they will encounter in the real world.

## **5.6 Enhances Cognitive Development in Learners**

Findings by Plass et al. (2015) showed that gamification in eLearning enhances cognitive development in learners, especially adolescents. This is because most of the games that are used in eLearning are “brain games” which challenge the brains of the learners either to think critically on how to solve a given challenge posed in the game for them to complete the level and receive a reward successfully. In eLearning, brain games are becoming increasingly popular and are designed in such a way that they pose various problems that need students to use their critical thinking skills to solve the problems. Through this, the parts of the learners’ brain that think critically are stimulated to always access a given risk before formulating all possible ways in which the risk can be mitigated. Niebaum and Bunge (2014) contend that our brains are like muscles. Their ability to think increases when they are challenged and used to come up with solutions to solve the challenges faced. This implies that by using brain games in gamification in eLearning, students are challenged to use critical thinking in solving problems posed in games, hence increasing their thinking capacities and the rate at which their brains process and maintain information.

## **5.7 Gamification Can Be Used For Learning Beyond Classrooms**

Rozman and Donath (2019) assert that a great number of students fail in their studies due to the negative notion that has been portrayed about classroom studies. The traditional classroom setting in which students listen to their teachers as they teach them concepts before giving them loads of HomeWorks to do makes it difficult for learners to find learning to be exciting. Through gamification, learners can learn in not only classrooms but also when they are at home. Unlike the traditional learning experiences in which learners ought to learn concepts for huge books and write short notes on the concepts they are learning; gamification has taken learning to an entirely new level. As long as the students will be playing the games provided in a given eLearning course, they will be learning concepts that are involved in that particular course, regardless of the place or the time they are playing the games. Kaufmann (2018) affirms that students who become addicted to playing the games that are provided in each eLearning course continuously explore and learn the concepts involved in that course even without knowing that they are bettering their understanding of the given course. Through this, the students learn given concepts involved in the eLearning course repeatedly, hence bettering their chances of passing assessments and examinations tested in that course and effectively solving real-life problems that would require them to employ concepts learned from the course in their daily lives.

## **6. DISCUSSIONS AND CONCLUSION**

This study focused on investigating three aspects related to the gamification of education. These aspects included, 1) to determine the theoretical background supporting the application of gamification in the education sector, 2) to evaluate the gamification frameworks and structures applicable in learning engagement and enhancement, and 3) to discuss the potential benefits of gamification in the learning experience and e-learning. Currently, gamification is a new concept that implies the application of the game elements and digital game design techniques to non-game problems such as business and social impact challenges. The study found that the major objective of gamification should focus to have a direct effect on the attitudes and behaviors, which are relevant

and directly influence the learning activities. These behaviors are attitudes, which in turn influence the instructional and learning content given or accessed by the students, and the resultant learning outcome. It is a great idea for educational sectors and educational institutions to start thinking and consider how computer games, or rather, the concept of gamification could be applied to enhance educational activities. Computer games, if they are designed appropriately have a great potential to keep the learners and students engaged, with potentially complicated tasks and assignments. In response to the first objective of the study, this study found out that the applicable theory is the Theory of Gamified Learning. The theory considers gamification as the process of linking the learning and research elements, in the context of gamification literature and serious games. The theory is based on two major aspects; 1) that gamification should target behaviors or attitudes that affect learning and, 2) that gamification can target behavior or attitude that makes existing instruction more effective. In addition, the theory of gamified learning incorporates the game attributes that could be used in advancing and enhancing learning activities. For instance, the action language, assessment, conflict, and challenges, control, environment, game fiction, human interaction, immersion, and rules or goals. The second objective evaluated the gamification frameworks and structures applicable in learning engagement and enhancement.

The structure and framework should consider applying several principles, which include the goals and objectives principle, accomplishment principle, reinforcement principle, competition principle, and fun-oriented principle. Some elements must be included in the game for it to function properly. These include input, processing, and output. The user is also required to have a proper check of the surrounding environment and boundaries, and the interaction-taking place through the interface. The game also needs to have other elements referred to as the 'attractive' or 'magnetic' cues, which are vital in enticing the players into the game, increasing their engagement to continue playing the game. The third objective investigated the benefits of gamification on education and learning experience. A critical review of the literature helped develop a summary of these benefits. They include an increase in learners' engagement, making learning fun and interactive, improving the learners' knowledge, absorption, and retention, giving the learners an opportunity of seeing real-world applications, giving the learners an opportunity of learning at their pace, enhancing the learning experience for people from all age groups, enhance the cognitive development of learners, as well as application of the learning beyond the classroom.

From the theoretical implication perspective, this study found that only one theory was effectively aligned with the concept of gamification of education. This is the Theory of Gamified Learning. From a critical perspective, the research found the literature is limited in terms of theories that expound on the concept of application of gamification on education. Other theories, which seem to attempt to explain this concept include the Cognitive Learning Theory, which indicates that gaming stimulates the mental processes of thinking, memory, and problem-solving. Another is the constructivism theory, which indicated that gamification incorporates the constructivism aspects such as social development and cognitive apprenticeship. However, the implication is that still need more theories that comprehensively address the aspect of gamification in education, especially its element and components. From the practical implications, gamification in learning is a new concept that needs to be considered, adopted, and implemented since it has the potential of improving and enhancing learning experiences and outcomes.

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