



# UTILIZING GAMING ELEMENTS FOR EFFECTIVE TEACHING AND LEARNING IN THE 21<sup>ST</sup> CENTURY CLASSROOM.

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## Abstract

The study investigated utilizing gaming elements for effective teaching and learning in the 21<sup>st</sup> century classroom. The study was conducted at Tower of Love Montessori School, Transkalabari, Rumuolumeni, Port Harcourt. Two objectives and two research questions were used for the study. The population of the study comprised of all teachers at Tower of Love Montessori School, Transkalabari, Rumuolumeni, Port Harcourt. A sample of 25 teachers were randomly selected for the study of the sampled school. Mean and standard deviations were statistically used for the study. Simple stratified random sampling techniques was used for the study and the instrument used to collect data was a structured questionnaire titled Utilizing gaming elements for effective teaching and learning in the 21<sup>st</sup> century classroom (UGEETLCC) with 27 items. The designed instrument by the researchers was given to experts in the field of educational Technology for its validity. Test retest was applied to ensure reliability of the instrument and attained reliability of 0.84 coefficient. The study found that visual space, barriers, color, sound, lighting, mystery, action, challenge, being at a risk, and uncertainty of outcome. However, teachers utilize gaming elements that creates effective learning games in the 21<sup>st</sup> century classroom to foster engagement and retention in students. Based on the conclusion, the following recommendations were made by the researchers: More gaming elements that creates learning games should be adopted and improved upon by teachers who wish to use game techniques in classroom. Teachers need to be exposed to other ways to gamify their classroom.

**Keywords:** Gaming element, teaching, century classroom.

## Introduction

Gamification has been a rising technology trend since 2010. Its growing popularity is stemming from the belief in its potential to foster motivation, behavioral changes, friendly competition and collaboration in different contexts, such as customer engagement, employee performance and social loyalty. As a result, it has been applied in various domains including marketing, health care, human resources, environmental protection and wellbeing (Lazzaro, 2004).

Gamification in education refers to the introduction of game elements and gameful experiences in the design of learning processes. It has been adopted to support learning in a variety of contexts and subject areas, but to address related attitudes, activities and behaviors such as participatory approaches, collaboration, self-guided study, completion of assignments, making assessments easier and more effective, integration of exploratory approaches to learning, and strengthening student creativity and retention (Caponetto, Earp, Ott, 2014).

Digital games have the potential to create active and engaging learning environments, supporting problem-solving, and learning through practice. This is true for primary school students as well as seasoned corporate learners. Learners can play, explore, experiment, as well as learn with game-based learning. However, using games for learning requires a rethinking of the learning objectives, a new model for ownership of tasks, complex structures for support of learners, new ways of evaluating learners, and a host of technological integration issues that have to be undertaken (Sweetser and Wyeth, 2005).

Gamification in Education is the process of transforming typical academic components into gaming themes. Gamification endeavors to literally create a game out of learning by theming all components of classroom in a game metaphor; make class like one big first-person game (McCarthy and Wright, 2004). Remember that the goal is to enhance learning by increasing student engagement.

Theming classroom in a gaming metaphor requires choosing a theme (ie: medieval times, fantasy mystic, space battles, military, spy/secret agent) and referring to everything in the class with gaming terms (student=player, assignment=quest, grade= quest points, class party = game reward).

The most important indicator of a student's knowledge attainment is engagement; the level of attention and personal involvement a person has with an activity. The more engaged the students are with the learning process, the more they will internalize the learned skills (Light, 2006). Studies on gamification show that the use of gamification in the classroom increases student engagement. With engagement being the key reason to gamify the classroom, consider:

- Gamification increases competition which can lead to engagement.
- Gamification involves creativity and student choice, which increases engagement.
- Gamification gives students immediate feedback (through peer feedback, progress bars, badges, teacher response, etc.) and allows them to easily track their progress towards academic goals (Koster, 2005).

For these reasons, gamification is a great tool to use to improve the overall education experience for students.

Games, in any form, increase motivation through engagement. Nowhere else is this more important than education. Nothing demonstrates a general lack of student motivation quite like the striking high school dropout rates: approximately 1.2 million students fail to graduate each year (Alfrink, 2011). At the college level, a Harvard Graduate School of Education study "Pathways to Prosperity" reports that just 56% of students complete four-year degrees within six years. It is argued that this is due to current systemic flaws in the way we teach; schools are behind the times. Watch a single lecture on innovation trends in education, and the presenter likely notes the striking similarities of a modern-day classroom and one of centuries past. It is being proven that gamifying other services has resulted in retention and incentive. For example, website builder DevHub saw the remarkable increase of users who finished their sites shoot from 10% to 80%. So, in theory, it should work for schools as well.

There are several assumptions underlying the usefulness of gamification in educational context such as gamification is engaging, gamification is motivational, and gamification can improve participation in classroom. Gaming element that creates effective learning includes; visual space, barriers, color, sound, lighting, mystery, action, challenge, being at risk and uncertainty of outcome. Teachers gamify in the classroom in the following ways; award students with badges, integrate educational video game into school curriculum, stir up a little competition, gamify grading, implement a class wide reward system, gamify homework to encourage informal learning, create a digital customizable classroom management system built on role playing them.

Using games in teaching can help increase student participation, foster social and emotional learning, and motivate students to take risk. According to Sager (2021), playing games in the classroom can increase overall motivation. Students become more motivated to learn, pay attention, and participate in class activities. They can also be great classroom management tool, helping to motivate a class. Games in the classroom provided more motivation if the learning was the playful part and not just a side note to the activity. As games can move quickly, a student need needs to be alert and attentive for extended periods. Games benefit students by helping them shape their attentiveness and training the brain in hoe to learn. Using different instructional approaches in the classroom, such as playing games, enables students to encounter the content in various ways, making it easier for them to pay attention after the activity has ended. It is found that kids who designed their cities using simulation games showed stronger problem-solving skills than peers who learned about cities in more traditional ways. Playing interactive educational games may have a positive impact on children's problem-solving skills and engage them in advanced mathematical thinking. Playing video games in the classroom was tied to students' sense of pride and emotional connectedness to their peer, although this seemed more prevalent in boys than in girls. Video games in particular help students build up their memories and benefits last well into adulthood. Re-working a lesson as a game makes students more receptive to learning a concept.

Stathakis (2020) argued that as much as games in the classroom are about learning a concept, they are also about learning from what goes wrong, which gives students both the problem-solving development and the social emotional benefits too.

Games involve a system or space with players, an abstraction of reality, a challenge, rule interaction, give feedback, have a quantifiable outcome, and involve an emotional reaction (Kapp, 2012). Gamification, on the other hand, is the use of game elements, design, aesthetics, and game thinking in content to promote motivation, engagement, learning, and problem solving (Redondo & Vilas, 2013). Due to the confusion between gamification and games. Kapp (2012) pointed out what gamification is not: stand-alone game; very little art-styles, theme, application and narrative, trivialization of learning; foreign to learning professionals; perfect for every learning situation; and only game mechanics.

Creating a gamified course that promotes student motivation requires a deep understanding of what makes people engaged in videogames. Gamification is not as easy to create because it requires deep thinking about the whole learning experience rather than focusing on the elements solely (O'Donovan, Gain & Marais, 2013). Nicholson (2012) noted that designing meaningful gamification should meet the needs and the goals of the user. Well-designed gamified content can be engaging and enhanced motivation because they tap into the cognitive, the emotional, and the social areas of the players (Lee & Hammer, 2011).

According to Jenkins (2016), there are many ways gamification can be rendered ineffective in an educational setting. Here are a few gamification problems to avoid while considering adding an element of gamification to training:

### **1. One Size Does Not Fit All: Know Your Audience**

The most frustrating part of gamification is that lightning does not strike twice. Many designers have created an educational mini-game that was extremely successful in one course, only to turn around and have it completely flop in another. This does not mean the game was poorly constructed, but it does mean that it was poorly implemented. By learning more about what motivates and engages audience, it can take that information into game development. This process will also help in understanding whether or not a gamified course will even be

effective. If it is discovered that the audience is made up of people who do not like video games, then it is better not to include an element that will likely make their learning experience more difficult.

## **2. Gamification Is Complex: Keep It Genuine**

Gamification is a tool, but calling it that tends to oversimplify the concept. Yes, it is a tool designed for a purpose, but it is important to remember that both the tool and purpose are extremely complex. Not only does misusing gamification in a training course result in wasted resources, but learners will have no patience with a game once they discover it has no real purpose or it was created haphazardly.

## **3. There is Plethora of Choices: Be Picky**

Today's game design landscape is filled with development tools that make it possible for anyone with a computer to create a game. While this is great for the tech community, it also tends to negatively impact overall quality. This means Instructional Designers need to be selective about the type and quality of games that they decide to incorporate.

## **4. A Game can be a distraction: tie it to a learning objective**

Perhaps the most crucial pitfall of gamification is adding a game to a course without seriously considering its purpose. Keep in mind that when games are not educational, they are recreational. A game that is not working is nothing more than a distraction to learners. The best way to overcome this obstacle is to approach gamification the same way one would approach assessments, knowledge checks, and other core Instructional Design components. If there is a concept that can be reinforced or taught with a game, then make the presentation of that concept the game's primary function. It is better to scrap a game that is not teaching something than it is to keep a game that is just going to throw learners off track. (Jenkins, 2016).

### **Statement of the problem**

Learning games have to present appropriate challenges to the learners to garner their attention and make sure they learn from the gaming experience. If the gaming experience is too simple, learners will lose interest and quit. If it is too hard, learners will give up in frustration. If the level of challenge is just right for learners, they will find the problems they solve to be motivating and fun and most importantly learn from them. It is important to design the challenges to suit the majority of the learners. If the learner group has a mix of expert and novices, it is then better to demarcate initial challenges and keep it optional for experts who might find it too easy but will be interesting for novices to attempt. Games can teach a wide range of knowledge and skills. Learning experts in the corporate sector are fast realizing that and channelizing funds to create simulation games to engage and train corporate learners. With appropriate design strategies, it is possible to ensure that learning games are effective and impactful for divergent audiences.

### **Aim and objectives of the study**

The aim of the study is to investigate the utilization of gaming elements for effective teaching and learning in the 21<sup>st</sup> century classroom.

Specifically, the study intends to investigate out the following:

1. Examine the elements of gaming for effective teaching and learning in the 21<sup>st</sup> century classroom
2. Investigate the ways gaming can be used in the 21<sup>st</sup> century classroom
3. Determine the problems of gaming in classroom teaching

## Research Questions

1. What are the elements of gaming that can create effective learning game in the 21<sup>st</sup> century classroom?
2. What are the ways to gamify in the 21<sup>st</sup> century classroom?
3. What are the problems of gamification in classroom teaching?

## Methodology

This study is a descriptive survey research designed to investigate the utilization of gaming elements for effective teaching and learning in the 21<sup>st</sup> century classroom. The population of the study comprises of all teachers of Tower of Love Montessori School, Transkalabari. Rumuolumeni, Port Harcourt. A sample of 25 teachers was used for the study. Simple Random stratified sampling technique was used for the study. The Instrument used to collect data from respondents is a structured questionnaire titled Utilizing Gaming Elements for Effective Teaching and Learning in the 21<sup>st</sup> Century Classroom. (UGEETLCC) with 27 items. To ensure validity, the designed instrument by the researchers was given to experts in the field of measurement and evaluation. This was done to help the researcher assess the quality of each item in the context of clarity, ambiguity and generality of the items. Their various comments and assessment gave the researcher the conviction that the instrument is appropriate and valid for the research.

To determine the reliability of the instrument, test-re-test was applied; 20 copies of the instrument were administered on some teachers at two different occasions within three weeks. Their responses to the questionnaire item in the two separate responses were correlated to attain the reliability co-efficient of 0.84. The responses from the questionnaire were weighted on the four- point Likert type scale of strongly agreed, agreed, strongly disagreed and disagreed. Data obtained were analyzed with mean and standard deviation.

## Results and Discussions

### Research Question 1: What are gaming elements that creates effective learning games?

**Table 1.1: Gaming elements that creates effective learning games.**

S/N	Items	Mean	Standard Deviation
	<b>Gaming elements that create effective learning games</b>		
1.	Visual Space	3.80	0.40
2.	Barriers	3.68	0.47
3.	Color	3.76	0.43
4.	Sound	3.68	0.47
5.	Lighting	3.96	0.20
6.	Mystery	3.56	0.50
7.	Action	3.76	0.43
8.	Challenge	3.60	0.50
9.	Being at a risk	3.76	0.48
10.	Uncertainty of outcome	3.60	0.47
	<b>Average Mean</b>	<b>3.71</b>	<b>0.43</b>

The table 1.1 revealed that teachers accepted all the items as the element of gaming that creates effective learning game in the 21<sup>st</sup> century classroom. This is because all the item mean was above the criterion mean of 2.50. Therefore, the study found that visual space, barriers, color, sound, lighting, mystery, action, challenge, being at a risk, and uncertainty of outcome.

### Research Question 2: What are ways to gamify in the 21<sup>st</sup> century classrooms?

**Table 1.2 Ways to gamify in the 21<sup>st</sup> century classroom**

S/N	Items	Mean	Standard Deviation
	<b>Ways to gamify in the 21<sup>st</sup> century classroom</b>		
1.	Award students with badges	3.64	0.48
2.	Integrate educational video games into school curriculum	3.68	0.47
3.	Stir up a little competition	3.72	0.45
4.	Gamify grading	3.60	0.50
5.	Implement a class wide reward system	3.64	0.48
6.	Gamify homework to encourage informal learning	3.64	0.48
7.	Create a digital, customizable classroom management system built on role playing themes	3.76	0.43
	<b>Average Mean</b>	<b>3.66</b>	<b>0.47</b>

The table 1.2 revealed that teachers accepted all the items as the ways to gamify in the 21<sup>st</sup> century classroom for effective learning games. This is because all the item mean was above the criterion mean of 2.50. Therefore, the study found that awarding students with badges, integrate educational video games into school curriculum, stir up a little competition, gamify grading, implement a class wide reward system, gamify homework to encourage informal learning, create a digital, customizable classroom management system built on role playing themes.

### **Research Question 3: What are the problems of gamification in classroom teaching?**

**Table 1.3: Problems of gamification in classroom teaching**

S/N	Items	Mean	Standard Deviation
	<b>Problems of Gamification in classroom teaching</b>		
<b>1</b>	Lack of planning and strategy	3.46	0.54
<b>2</b>	Gamifying bad goals can be as destructive as ignoring goals altogether	3.50	0.56
<b>3</b>	Poor design	3.52	0.55
<b>4</b>	Unrealistic expectations	3.49	0.55
<b>5</b>	Poorly implemented game mechanics can drive motivation and engagement, and bring fun to a classroom process that might otherwise be dull	3.51	0.55
<b>6</b>	It is expensive	3.40	0.53
<b>7</b>	Decreases student attention span	3.38	0.55
<b>8</b>	Students' assessment	3.41	0.59
<b>9</b>	Games can be costly to develop, and costly to maintain	3.37	0.53
<b>10</b>	Games can be a source of distraction	3.65	0.48
	<b>Average Mean</b>	<b>3.47</b>	<b>0.54</b>

Entries 1.3 revealed that teachers accepted all the items as the problems of gamification in classroom teaching. This is because all the items mean was above the criterion mean of 2.50. Therefore, the study found that games can be a source of distraction in classroom teaching and also, gamifying bad goals can be destructive as ignoring goals altogether.

## Discussion of Findings

### **Research Question 1: What are the elements of gaming that creates effective learning game in the 21<sup>st</sup> century classroom?**

The study found that visual space, barriers, color, sound, lighting, mystery, action, challenge, being at a risk, and uncertainty of outcome. The teachers sampled in this study were accurate in their agreement about the utilization of games in the classroom to foster engagement and retention. Advancement in technology has brought about so many methods to help improve students' academic success. However, more teachers need to be aware of the importance of gamification in education.

The study is agreement with those of Groh (2012) who found that with the use of certain elements of gaming there is increase in motivation since players feel as though there is always something new to look forward to.

The study is also in agreement with those of Alexious & Schippers (2018) who found that the role of narratives, aesthetics and core game mechanics in facilitating higher learning outcome through intrinsic motivation and engagement.

### **Research Question 2: What are the ways to gamify in the 21<sup>st</sup> century classroom?**

The study found that awarding students with badges, integrate educational video games into school curriculum, stir up a little competition, gamify grading, implement a class wide reward system, gamify homework to encourage informal learning, create a digital, customizable classroom management system built on role playing themes. However, teachers gamify in various ways in the classroom to improve students' performance. The teachers sampled in the study were accurate in their agreement to the ways they use games for teaching and learning. Technology has helped drive change in order for students to improve academically. However, more designs of gaming should be encouraged for motivation and retention in students.

The result is in agreement with those of Zichermann and Linder (2013) who found that teachers use rewards and feedback to foster communication, creativity and critical thinking in students.

The result is also in agreement with those of Measles & Sumayah (2015) who found that games have been used in education in order to engage and motivate learners.

### **Research Question 3: What are the problems of gamification in classroom teaching?**

The study found that games can be a source of distraction in classroom teaching and also, gamifying bad goals can be destructive as ignoring goals altogether.

The result is in agreement with those of Harviainen (2014) who found that several challenges to learning through game-based systems still exist, and that these problems have to a large extent been identified decades ago. These include excessive competition, cheating, harmful stealth learning, a false sense of safety, lack of accurate evaluation, the ways in which game-based learning and gamification are reliant on personal and contextual factors, and the treatment of theoretical works as implicitly reliable by many researchers.

Also, the result is in agreement with those of Rodrigo, Sandro & Jaques (2020) who found that there was a change in behavior of the gamified group showing a significant improvement in the accuracy of students with personality traits with low agreeableness, low openness, and introverts who used the gamified version in the second half of the course.

The study is also in agreement with those of Chong (2019) who found that future gamified education in physiotherapy can provide authentic experience through class designs and gamification mechanics to foster learning motivation.

## Conclusion

The following conclusions were made by the researchers:

1. It was found that visual space, barriers, color, sound, lighting, mystery, action, challenge, being at a risk, and uncertainty of outcome. However, teachers utilize gaming elements that creates effective learning games in the 21<sup>st</sup> century classroom to foster engagement and retention in students.
2. It was also found that awarding students with badges, integrate educational video games into school curriculum, stir up a little competition, gamify grading, implement a class wide reward system, gamify homework to encourage informal learning, create a digital, customizable classroom management system built on role playing themes. However, teachers gamify in various ways in the classroom to improve students' performance

## Recommendations

Based on the conclusion, the following recommendations were made by the researchers:

1. More gaming elements that create learning games should be adopted and improved upon by teachers who wish to use game techniques in classroom.
2. Teachers need to be exposed to other ways to gamify their classroom.

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