

Gamification Teaching Technique During the Pandemic: A Review

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Abstract: This paper is related to a study conducted to look at the growing learning process either within or outside the country, namely Game-Based Learning techniques that are increasingly applied during pandemic situations worldwide. *GBL* techniques that practice gamification in the learning process are described in detail to make it easier for teachers and students to better understand *GBL*. In pandemic situations where students cannot follow the learning process physically, the use of this *GBL* can be used to replace traditional teaching technique which is reliant on papers and books. This study which uses non-empirical method on one type of learning game, Minecraft Education Edition, will be observed through personal observation method. By using the *Mechanic, Dynamic and Aesthetics framework* and also the game experience application, the results of using this *GBL* technique will shown the proof of importance this technique to helps in the learning process.

Keywords: Games, Gamification, Education, Pandemic, Learning

1. Introduction

In a world full of technological developments, the entire education system is undergoing significant changes, as seen over the past decade. An education system started with traditional education in the classroom, changed to an Open Distance Learning system (*ODL*) to the latest system that is Game-Based Learning (*GBL*) which is seen to lift the education system towards more digital and creative. Since the onset of the pandemic episode in 2019, the education system has experienced maximum disruption where more than 200 countries worldwide have digitally changed the educational landscape [1].

Engzell et al. [2] stated that during this pandemic, the educational process, which is usually face-to-face had to be cancelled because safety factors can affect student learning. In addition, the writer stated that the effects of this pandemic have significant consequences in the learning system where as much as 95% of the student population worldwide has been affected. It's change of learning techniques from face-to-face and writing to online techniques encourage teachers and students to be proficient in using technologies such as Microsoft Teams, Google Classroom, Canvas and so on [3].

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According to [4] due to the effect of lockdown in the long run, then the learning process should be changed strategically to focus on online learning. Learning process that use game based can be used as a tool for students to interact, give feedback and develop mental as well as social development [5].

Esa et al. [6] stated cognitive theory shows that using game elements in the learning process helps students become more observant and recognizable than using traditional methods like writing in a book. To state *GBL* is a good technique that can be applied during this pandemic, some issues must be examined and assessed to determine whether this *GBL* technique can assist students in their academic endeavour during the pandemic. The objective of this research is to ensure that the new technique in learning using *GBL* during a pandemic is good for students even do not meet face to face and without using the main medium such as writing in book. Huang and Soman [7] state that a learning system with elements of games can provide an innovative and flexible environment for students, allowing students to more easily receive knowledge. Furthermore, Rohaila and Khalid [8] stated that the use of game-based learning in the learning process can make teaching sessions more active and bring national education system to higher level.

2. Materials and Methods

This study will use the non-empirical method where this method will help get results in this writing. Dan [9] stated that this non-empirical method is often used to obtain findings without going through systematic data collection and data analysis. Non-empirical method will obtain findings through the process of personal observation, reflection on current events and/or the authority or experience. Because of that, this non-empirical method will be used as a research method in this study. This can be seen in **Figure 1** below which shows a clear figure of the non-empirical method.

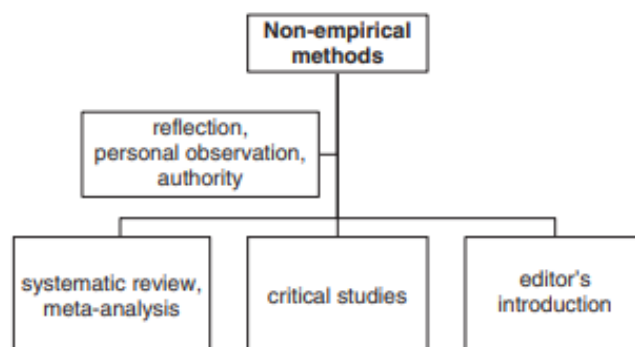


Figure 1: Non-empirical method [9]

2.1 Gamification Concept

Gamification can generally be described as a process or technique of approach that has become a new trend in which this technique highlights the process of mechanical and dynamic integration through video games out of context [10]. Deterding et al. [10] mention that the use of this frequently used term gamification was introduced in 2008. The mechanics here refer to points, levels, challenges, virtual goods, leader boards, badges, and gifts while the dynamics in the game mean reward, status, achievement, self-expression, competition, and altruism [11].

They also stated that in learning techniques using gamification, the *MDA framework* can be applied to stimulate desired behaviours and at the same time be able to establish control over outcomes. This *MDA framework* which means Mechanics, Dynamics and Aesthetics in the game is designed based on the development theory of a video game. *MDA framework* which contains three components namely mechanics, dynamics and aesthetics can also be described in looking at its use in the learning process. In [12] that mechanics states about the description of each component or rule in the game specifically through programming processes, data representation and also algorithms.

Dynamics, on the other hand, is an aspect of the response of the components of a mechanism in real time that is influenced entirely by student input. Aesthetics, on the other hand, is an internal and external emotional response that results from students or players when interacting with a game. Each component in the *MDA framework* can be seen in **Table 1** below.

Table 1: Table of MDA Framework Components

MECHANIC	DYNAMIC	AESTHETIC
Points	Rewards	Satisfaction
Levels	Status	Fun
Challenges	Achievements	Jealous
Virtual Goods	Self-expression	Honor
Leader Boards	Competition	Relationship
Badge	altruisme	
Gifts		

To see the extent to which each component in this *MDA framework* interacts in relation to each other, it can be seen in **Figure 2** which clearly describes in detail what happens between the mechanical, dynamic, and aesthetic components. Through [11] stated that in the process of game development, the game designer will start or set the rules (mechanic) first. After that, it will develop a system (dynamic) in the game to be able to provide fun (Aesthetic) to game players. While if viewed from the player's point of view, it starts with enjoying the aesthetic value in a game where each game also has a dynamic that will be felt. After that, the player will play based on the instructions of the game mechanic that has been designed and developed by the game's designer [13].

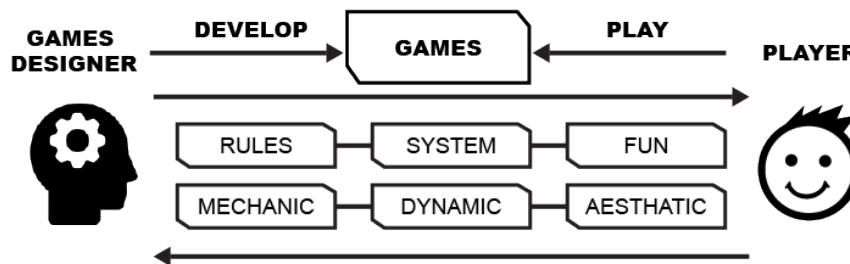


Figure 2: Processing and interactions between MDA framework components

3. Results and Discussion

The game selected is a digital game that is *Minecraft Education Edition*. **Figure 3** below shows images of *Minecraft Education Edition*. In writing of [14] explained in their study that games like *Minecraft* are education -based games that are an option where they are used abroad in teaching lessons not only related to computer science. The game is also used to teach science subjects such as biology, technology, and chemistry as well as subjects related to humanities such as history, language teaching and civics.



Figure 3: Display images of *Minecraft Education Edition*

MDA framework components will be used. Based on personal observation, **Table 2** clearly displays the findings obtained in the game *Minecraft Education Edition* through *MDA framework* components. The use of *MDA framework* is used to ensure that the selected game has *MDA* components where it helps the learning process to be more interesting, creative and able to make students more motivated to follow the learning sessions.

Table 2: Table of *Minecraft Education Edition* *MDA*

<i>MDA FRAMEWORK</i>	<i>MDA COMPONENTS</i>	
<i>MECHANIC</i>	Points	✓
	Levels	×
	Challenges	✓
	Virtual Goods	✓
	Leader Boards	✓
	Badge	✓
	Gifts	✓
<i>DYNAMIC</i>	Rewards	✓
	Status	✓
	Achievements	✓
	Self-expression	✓
	Competition	✓
	Altruism	×
<i>AESTHETIC</i>	Satisfaction	✓
	Fun	✓
	Jealous	✓
	Honor	✓
	Relationship	✓

The result of the observation is clearly seen that the use of mechanics in this game is comprehensive except for the level. The decision occurred because of the way the game was played where the game had no levels for students to reach. While if seen in the dynamic, five of the six components have been used in the production of this game where every time students play this game, they will get a reward when they successfully perform a task. Similarly, the status where when they succeed in the competition between other players, their status will increase as well as increase their achievement to occupy the top ranking. The game also applies the component of self-expression because to play this game, players can build and produce their character based on what they are interested in or show their own character. However, in this game the altruism component is not applied because this game is not just to play but to cooperate with other players. Players will not play alone in this game.

If we look at the last component that is in the aesthetic, it can be clearly stated that all these components are used as well as possible in this game. Indeed, when players or students play this

game, they will be satisfaction with the whole game in terms of mechanics, dynamics, and aesthetics. The fun component is also seen to be able to be produced for players and students who play this game in the learning process. Unlike the traditional learning process center on books and papers, by using game techniques, students can be entertained and will not be stressed at the same time will make them happy. With the challenges in this game, students will also have a feeling of jealousy to be a winner or be a player who has a high point but still maintains the value of honor for other players and at the same time every player and student will be able to communicate better and make good relationship.

3.1 Game Experiencing in Learning Gamification

In addition to using the *MDA framework*, this study will also use the game experience application produced in [15] study. In **Table 3** shows the results obtained based on the method of personal observation on the game Minecraft Education Edition and using the game experience application table.

Table 3: Game experience application with gamification game approach

Game Experience Game Approach	Game Thinking	Game Elements	Virtual worlds	Serious game	Non Purposeful
<i>Minecraft Education Edition (Gamification)</i>	•	•	•	•	

It can clearly be seen that this Minecraft game has game thinking. When a game is produced based on learning, then the game will cause the players and students to use the maximum of their thinking to play. The game must have a game element that is able to help students to play while learning something. It is clear this game has learning element. When the pandemic is hitting, students are unable to attend school due to health factors, so the use of virtual world is very important because students can learn directly and not require them to meet physically. Through serious games, students will go through a game experience related to learning -based games. From [16] in his writing explains that a game is produced for entertainment only and to be played without specific instructions. Yet games based on educational practices will use serious games [17].

4. Conclusion

This study was produced because it looks at the current environment of the learning process. The pandemic situation that is plaguing not only in the country but the whole world is seen to change the learning landscape totally. Using Game Based Learning through this gamification technique can help teachers and students follow the learning process more easily, efficiently, and creatively. Besides, in the learning process, what is more important is how students can understand everything presented by the teachers. In [18], state that *GBL* method is able to achieve the goals in the teaching process carried out by teachers if implemented in the learning system.

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