Positive Impact of Gamification on the E-Learning Process

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Abstract:- The evolution of technology has led to many effects on the learning process. One of the notable effects is how it impact the gamification for learning application, which also known as e-learning. Nowadays, many of the designer and developer of the learning application include the gamification on the learning process. There are many positive impacts on the use of gamification element in the e-learning. This study aims to see the positive impact of gamification on the e-learning process. The keyword used to conduct this study is 'gamification'. As the result from the study, it shows that the use of gamification in learning process can give many positive impacts on the learning process and it is in demand to improve learning process.

Keywords:- Gamification, E-Leaarning.

I. INTRODUCTION

Traditional learning method is a process of learning where the teacher delivers the learning in a classroom set-up which has been around for thousands of years [1]. The students and the educators present in the same room for the learning process, and the educator will deliver the learning material directly to the students. However, the education line has changed the learning process method around 1950's where the traditional method has changed with the aid of computers that increase both interest between the educators and students which extend the classroom activities [2] and known as e-learning.

E-learning is a process of learning process with the help of electronic resources, where part of it is the use of computer, any gadgets and internet [3]. E-learning process is a modern method or even can be consider as alternative to old or known as traditional learning method [4]. The concept for e-learning is one of the technology-mediated learning approaches from the educational perspective [5], because it is a method which use the help of any of the technology element.

The emerging of e-learning and gamification technique is not something new in the recent years. E-learning can be challenging to conduct which has so many concerns, however the use of gamification can tackle some of the concerns. Gamification is the use of game elements applied into non-entertainment context such as e-learning [6]. Even though, the term 'game' has a general meaning used by the researchers, but generally it can be defined as the use of any game elements into non-entertainment context [7].

The adoption of the technology's innovation has motivated the educators to utilize any teaching tools available to promote the learning process to the students [8]. Not only tools, the use of any gamification elements into the learning process can be consider as an innovation. There are many gamification elements that can be include in the learning process such as, points, badges, leaderboard, level and feedback [9]. Another example, of gamification element that can be apply into the e-learning application, is ranking [10]. Currently, there are many elements that can be apply. However, it is not necessary to include all of the elements. As mentioned by Yung-Fu Wang et al. in their paper "The key elements of gamification in corporate training – The Delphi method" there are few common of gamification element that can be apply to increase the motivation of the students such as points, scoring and leaderboard [11].

As 2023, there are many educational applications that implement the gamification technique such as *TEDEd, Khan Academy, Coursera, Udemy* and many more. There are great numbers of benefit with the use of gamification in e-learning. Therefore, the present research aims to highlight few advantages of using gamification in e-learning.

II. MATERIALS AND METHOD

This research has been done by using Kitchenham Model [12] as shown in the **Figure 1** the same model has been adopted by M. Majchrzak, A. Ciesielska and J. Ostrowski [13] in their paper which is Motivation to Use Gamification Elements in E-Learning for Formal and Non-Formal Education. This research was done by phases which including planning, implementation and reporting. In the first phase, where the planning takes place, such as the identification of review purpose. Second phase is implementation, such as identification of research, selection of studies, and data extraction. The second phase is where the searched article was extracted and analyzed. The result from the second phase will be carry forward to the last phase which is review and report writing which produce the result for this research.
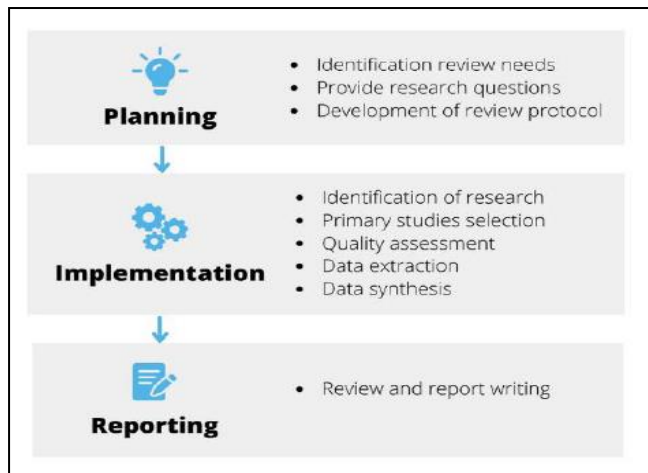
Fig. 1. Kitchenham Model

III. ADVANTAGE OF USING GAMIFICATION IN E-LEARNING

➢ *Increase the student's engagement and motivation*

It is without doubt the implementation of any simple gamification element such as points, badges, leaderboard level, and feedback [9] can increase the student's engagement and motivation with the learning process. There are many prior researches done to check the effectiveness of the gamification element to increase the student engagement. F. L. Khaleel, N. S. Ashaari, and T. S. M. T. Wook, in their paper "The impact of gamification on students' learning engagement" has shown that there is a positive impact on the gamification element in certain subject which is difficult for the student such as programming. The experiment involved 60 university student, where they use the gamification element such as leaderboard, points, badges and few more in their programming subject. To get the result, the researcher conducts a face to face interview with the experimental group. During the interview session, the students give positive feedback to the researcher where they explained the benefit of the gamification to their study. From the result of the experiment, it shows that the game elements have positive impact on the student's motivation that lead to the positive engagement. To support the same benefit of using the gamification, the same research has been done by I. Hidayatulloh, S. Pambudi, H. D. Surjono, and T. Sukardiyono where they implement the gamification features in the chat-bot learning media. In their paper, it is stated that gamification is a technique that can increase the students learning motivation [15].

➢ *Improve retention and recall*

Not only motivation, to help the learner to build a better retention is a challenge in the learning process. The retention of information is very crucial in learning process and some learners have difficulty to remember what they had learnt. The implementation of gamification technique can help to increase and improve the retention and recall the information during the learning process. The gamified learning process usually involving repetition, reinforcement and the retrieval which can lead to better retention. As stated by Sherin Eliyas and Ranjana (2022), one of the goal of gamification technique is to make the learner to think and act like a gamer

to improve the information retention. A good information retention due to the implementation of gamification feature such as avatar and points can lead to a better performance as well a good result [16]. The main function of e-learning is of course to convey the information, however the learning theory that support the implementation of gamification in e-learning can improve the memory retention is theory behaviorism by Skinner. Skinner in his theory has explained that repetitive response can improve the retention [17]. Furthermore, it should be noted that gamification feature can be designed to personalized the learning. Personalized learning can be achieved by tracking the learner's progress with the use of leaderboard ad the gamification element [11].

➢ *Skill development*

Another positive impact using the gamification is for the skill development. There are few skills highlighted from the prior study such as communication skill, decision making, problem-solving and critical thinking. Game feature in the e-learning usually required the learner to apply the skill in the learning process. Communication skills is very important especially in socializing. Theoretically, a number of research has been done to investigate the effectiveness of gamification to improve the oral proficiency. To support the theory of the effectiveness, one of the earlier researches has been done by Sourou Corneille (2023) using gamification to improve the Beninese's speaking aptitude in English. The research was conducted into two group which are the Control Group (CG) and Experimental Group (EG) involving student and teachers from local school in Beninese. The EG receive an instruction in gamified feature while the CG receive the instruction in traditional method. To collect the data for the research, the researcher uses few instruments such as questionnaire, interview and observations, and both qualitative and quantitative method applied. From the data collection and result of the research done, it has shown that the right gamification feature can make a powerful learning application to improve the learner's communication skills.

Early exposure to computational thinking (CT) skills can add the value to the young learner. The integration of gamification into the e-learning has come with so many positive impact and direct correlation with the technology in the 21st century. Pre-existing research has shown that the use of gamification in the e-learning for the CT skills for young learners has valuable impact where it has improved the motivation for CT skills. Finding from the previous researches has proven that there are different in shallow and deep use of gamification on the CT skills [19]. Another important skill that need to expose to the young learner to embrace the digital age is the critical thinking skills, with the merging of the gamification element with the recent technology can help to improve the critical thinking skills [20].

IV. RESULT

From the literature review, there common positive impact on the use of gamification on the e –learning process. The summary on the positive impact is in Table 1 and 2 below.

Table 1 Summary of literature review

Authors and Year	Title	Aim of study	Result(s)
Firas Layth Khaleel, Noraidah Sahari Ashaari, Tengku Siti Meriam Tengku Wook. October 2020	The impact of gamification on students learning engagement	Increase student's engagement in learning by conducted gamification technique in certain subject.	Game elements have positive effect on student's engagement
Indra Hidayatulloh, Sigit Pambudi, Herman Dwi Surjono, Totok Sukardiyono May 2021	Gamification on Chatbot-Based Learning Media: a Review and Challenges	Explored the possibilities as well the future challenges of the development of gamification feature within chatbot-based learning.	-The gamification feature must be engaging, provide empathy and personality. -A game element, such as a backstory, may be implement to boost the learner's motivation to complete the learning session.
Sherin Eliyas and Ranjana October 2022	Gamification: Is E-next Learning's Big Thing	To find the effects of gamification in e-learning.	Gamification is essential in the current education, to offer dramatic and instantaneous learning environment for younger individuals than conventional methodology.
Achmad Lutfi, Fitria Aftinia, and Bintari Eka Permani July 2022	Gamification: game as a medium for learning chemistry to motivate and increase retention of students' learning outcomes	To test the effectiveness of gamification in education that is appropriate to be used for hydrocarbon learning.	Learners are motivated to continue playing and learning, and improve the retention process.
Dr. Sourou Corneille TEBA 2023	Using gamification to improve Beninese primary pupils' oral proficiency: Case study of the experimental school of attaché	Investigate the effectiveness of gamification feature to improve oral proficiency among primary pupils in Benin.	Gamification is an effective method to improve oral proficiency and can lead to positive learning experiences for pupils.
Javier del Olmo-Muñoz, Andrea Bueno-Baquero, Ramón Cózar-Gutiérrez and José Antonio González-Calero 2023	Exploring Gamification Approaches for Enhancing Computational Thinking in Young Learners	Investigate the impact gamification techniques to the computational thinking skills and the intrinsic and extrinsic motivation.	Both shallow and deep gamification techniques are effective to improve the computational thinking in young learners. However, deep gamification technique may have a stronger impact on motivation.

Table 2 Summary of literature review

Authors and Year	Title	Aim of study	Result(s)
Sofia Marlena Schöbel, Andreas Janson, and Jan Marco Leimeister 2023	Gamifying Online Training in Management Education to Support Emotional Engagement and Problem-solving Skills	Evaluate the effectiveness the gamification element engagement and problem-solving outcomes.	The gamification elements do not directly improve problem-solving skills but are mediated by emotional engagement and affect positively influence problem-solving skills.
Rodrigo Smiderle, Sandro José Rigo, Leonardo B. Marques, Jorge Arthur Peçanha de Miranda Coelho and Patricia A. Jaques	The impact of gamification on students' learning, engagement and behavior based on their personality traits	Investigate the effects of gamification on students' learning, behavior, and engagement in a learning environment	Gamification affected users in distinct ways based on their personality traits in learning environment.
Jorge Francisco Figueroa Flores 2015	Using Gamification to Enhance Second Language Learning	Investigate the second language learning methodology, approaches and current applications used.	The use of gamification in learning contributes positively to the learning experience
Sairaj Balaji, Rajaram V and Swarna Sethu 2023	Gamification of Learning using 3D Spaces in the Metaverse	Gamify the learning and assessment experience, allow learners to compare progress, learn concepts, and collaborate with other learners	Positive impact on the learner using the latest technology.

V. CONCLUSION

As the outcome of this study, it has shown that not only to promote learning, the implementation of the gamification on can lead to many impact on the learner's side.

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