Original Research Article

Enhancing Student Engagement in Entrepreneurship Education For Undergraduate Student Through Gamification Methods

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ABSTRACT

Research consistently shows that increased student engagement positively influences their understanding of course material. This study investigates methods to enhance student engagement in learning activities through the application of gamification—integrating game elements into educational settings. Specifically, it examines the impact of gamification on teaching Break Even Point (BEP) calculations within an undergraduate Entrepreneurship course tailored for accounting students. The study reveals that integrating gamification significantly elevates student engagement and active participation, thereby improving the effectiveness and enjoyment of the learning process. Surveyed participants expressed a consensus that gamification has the potential to enhance learning across different subjects, highlighting its versatility in creating more interactive and stimulating educational environments. This research underscores gamification's efficacy as a pedagogical strategy to enrich educational outcomes and suggests its broad applicability for future teaching methodologies.

Aims: This research aimed to assess and implement gamification methods in teaching entrepreneurship learning materials at the undergraduate level. The study anticipates its findings to serve as a benchmark for educators seeking to enhance student engagement in their courses, particularly in Entrepreneurship. These outcomes are expected to offer practical insights and strategies for improving learning experiences and outcomes across various educational disciplines.

Study design: The research's method consists of three phases: First is to design the gamification method, second is the implementation and third is evaluation to understand the effect of gamification on student engagement in class.

Place and Duration of Study: The research will be conducted over a period of one week for a single topic. It will involve one class of college students which consists of 48 students from those who are enrolled in the entrepreneurship course.

Methodology: The first phase of the research will design the gamification method for one learning material. For current research, one learning material were chosen based on curriculum applied by *Sekolah Tinggi Ilmu Ekonomi Indonesia Surabaya*. The curriculum from mentioned educational institute were chosen since all the respondents participated in the research were student from fore-mentioned educational institute. Thus, a gamification of *Break-Even Point* was created during this phase. Second, the implementation, the students were asked to do certain assignments related to the research. Third, after completing the assignments, students are asked to provide evaluations of the tasks they worked on in the form of questionnaire surveys. These evaluations are then analyzed and form the basis of the research results.

Results: From 48 students, roughly 88% of the student (42 students) were interested with the gamification method given to them and it increase their knowledge on the topics. 10 students already know the topic delivered by the gamification from previous course they had

attended but think that the gamification method is interesting. The rest of the students feel no effect from the gamification at all.
Conclusion: From the result of the research, it is safe to assume that gamification method is effective to increase student engagement. Most students agreed when asked if the Entrepreneurship material presented was enjoyable. When asked if the method used was more engaging than traditional oral teaching, most students also agreed. Some students even suggested using the same method for future lessons.
Keywords: Educational, Gamification, Break Even Point

1. INTRODUCTION

The term “Student Engagement” earn it’s spot as one of the important issue internationally(Caponetto et al., 2014; Pedler et al., 2020). Due to it’s vast and wide range of scope, dimension and understanding, the definition of “Student Engagement” sometimes became malleable .The research that has been conducted by (Wong & Liem, 2021) define Student Engagement as two different components. First, the Learning Engagement which include all activities that happened in the classrom, including but not limited to task and activities need to be done by student. The second component is School Engagement, where it define the attachment each student had with their friend and teacher in the school.

Research conducted by (Holbrey, 2020; Wang, 2015) tried to utilize Kahoot! A commercial Quiz creator application that utilize gamification method to deliver the quiz to increase student engagement in traditional lecture theaters. The research reported increase in student’s engagement, retention and concentration. Inline with the research, the research that has been conducted by (Dorfner & Zakerzadeh, 2021) show increase of engagement and willingness from student to learn during the COVID pandemic era. Artificial Intelegence also had been used as one of the strategy to increase student’s engagement through hybrid education and yield positive result towards student engagement (Almusaed et al., 2023). Another form of Artificial Intelegence, the LLM (Large Language Model) Such as ChatGPT also has been utilized to create gamification for Grammar learning(Anpurnan et al., 2024) Through the increase of student’s engagement during the learning session, learning become more fun and effective, research show increase of student’s activity level (Lopez-Gazpio, 2022; Nadeem et al., 2023).

Increasing student engagement became an important matters, but the problem is, not every teacher know which strategy to apply during learning process (Pedler et al., 2020). A research that has been conducted by (Bond et al., 2020) gave insight on what other researcher had done between 2016 to 2021 to improve the student engagement. When talking about the strategy that has been done, the most used method are Social-Collabortive Learning(SCL) with 58,4%, in the second place, the Self-Directed learning with 43,2%, in the third place, the Game-Based learning with 5,8%, followed by Personal Learning Enviroment

(PLE) with 2,9%, other scenario 1,3% and 13,2% did not mentioned. The research also encouraged researcher in higher education to use text-based tools as it's main learning media due to highly effectiveness in increasing student engagement.

From the previous research, the usage of game-based learning as strategy of delivering education material are still considered low, with only 5.8%, there are still many unexplored means of Game-Based strategy. Game-based strategy or also widely known as Gamification strategy, is one of strategy to deliver learning materials through game-like process, for example, aspect of interarctivity with freedom to pick between certain options, reward-and punishment and others. Previous past research that employ this strategy show a promosing result(Beca et al., 2020; Dorfner & Zakerzadeh, 2021; Deterding, 2011; Satria, 2024). The research conducted by (Hamari et al., 2014) argue the effect of gamification method. The gamification method are indeed yield positive result, but it all depend on the way the gamification were created. The research conducted by (Lifindra et al., 2023) gamified math learning into puzzle-adventure-like game and yielded positive result, research conducted by (Su & Cheng, 2015; Wang, 2015) also show positive impact of gamification to student's engangement, despite some drawback of student wear out effect that has been defined by (Wang, 2015) that had been caused by class's dynamic. Despite the differences in learning material the researches tries to deliver. This showed that gamification is universial strategy that can be used to many different course using different media.

Enterpreneurship, as a college undergraduate course require unique consideration. Unlike many other course that were based on theory and understanding, the student's engagement on enterpeneurship course became crucial thing. In enterpreneurship course, student need to be included and active during the learning process, enterpreneurship require student's creativity and intuition(Kasali et al., 2010) to not just see what is around but also create something new, a business that has not been found before. The unique nature of enterpeneurship itself force the learning process to be unique. A traditional oral-speech method might not enough to deliver the enterpeneur course and have the potential of failed to deliver the course.

1.1 Formulating Research Question

From the introduction above, a problems were identified. First, gamification strategy has been proven effective to increase student's engagement. But previous research show small usage of gamification despite it's positive result. Second, the enterpreneur course, as a unique course which require student's participation and creativity would require high level of engagement. Meaning, a special strategy is required to deliver enterpreneur course effectively. Thus, from two problems above, a research question were formulated:

1. Can gamification strategy increase the engagement of Enternepenur Course?

To answer this question, research will be conducted to answer the formulated question. Thus, answering the question became the goal of the conducted research.

2. METHODS

The goal of the conducted research is to incorporate the fun and interactivity of gamification into an entrepreneurship course, which requires creativity and intuition from the students. A quantitative research approach will be utilized to achieve this goal. The first step is to formulate a method as guidance for the conducted research. The summary of the research method can be seen in Figure 1 below:

Fig.1 Method of Research

2.1 Defining Learning Material

The gamification process will be based on proposed theorical framework by(Rivera & Garden, 2021) But before entering the realm of gamification, first enterpeneurship course material that will be gamified need to be explained first.

Enterpreneurship course material from student's semester learning plan will be used as learning material that will be gamified. For current research, educational material: Break Even Point (BEP) will be picked as Enterpreneurship course education material that will be gamified (Utami & Mubarok, 2021)

2.2 Gamified Learning Material

After defining the learning material, next the learning material that has been choosen will be gamified. The idea of Break Even Point is to determine the price of an item (Utami & Mubarok, 2021). This idea were utilized to create the base of the gamification, to determine a price. The difference, however, instead of measuring the price of pre-defined item, student are able to create their own item before counting the BEP. The Flowchart of the Gamified Learning Material can be seen in the figure 2 below.

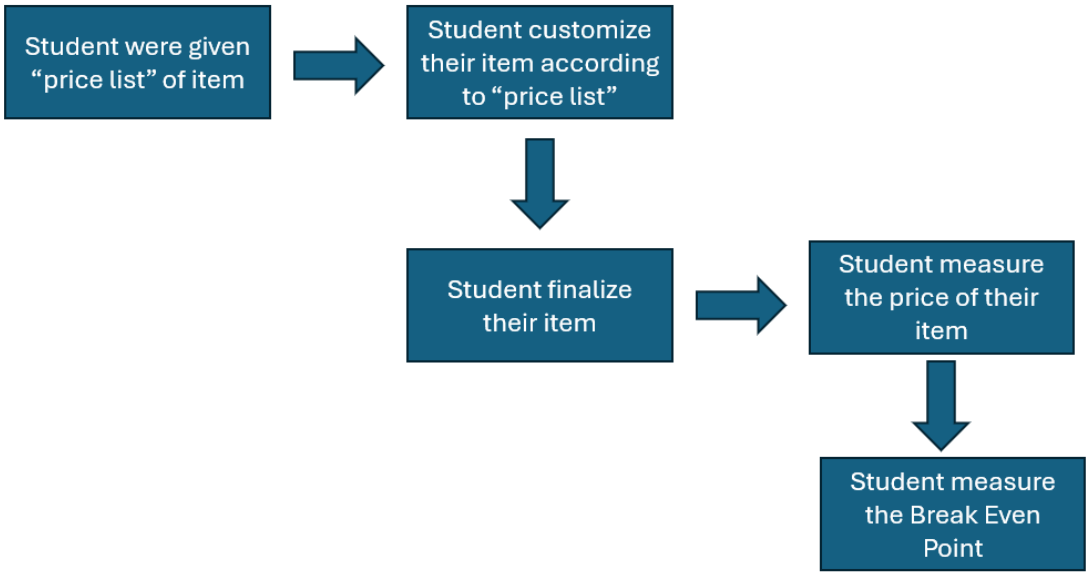

Fig 2.Flowchart of Gamified Learning Material

First, the students were provided with price lists of items they could choose from. They were given the option to customize their selected item based on the provided price list. Once they finished customizing their item, the students were then tasked with calculating the base price of their customized item. After formulating the base price, the students were asked to calculate the Break Even Point (BEP) based on the base price they had determined.

2.3 Tested Gamified Learning Material

The Gamified Learning Material will be tested to one class of undergraduate college students from Accounting Programs with total 48 students. The research will be conducted for one day, during the Entrepreneurship course. Each of the students were asked to do the same task with the limit of 120 minutes. Students were not allowed to take a break from the task, except bathroom break before submitting their BEP answers.

After submitting the answer, students were given questionnaire related to the previous task they had done, the questionnaire consists of question measured with Likert Scale (1-5) to evaluate the conducted gamification learning that previously has been done. Beside questionnaire, the score of student's answer were also counted and analyzed to evaluate the gamification.

3. RESULT AND DISCUSSION

The gamification for current research will use *Bakery* as it's main theme, meaning every item that appear in gamification process were baking product such as dairy, flour, wrapping. After completing the gamification, next student were asked to answer questionnaire, the answer of

the questionnaire along with student's score will be analyzed to measure the successful of the gamification process.

3.1 Gamification Material

First, student were given digital pamflet consists of catalogue of baking material that they can choose to customize their own bread. The example of flour material can be seen in figure 3.

Fig 3.Picking Flour Material

Student were given customization option for their own bread, beside flour, student were able to choose topping from the pricelist in figure 4.

Fig 4.Topping Catalogue

Student were given freedom to customize their own bread, there are No. limitation of number of topping each of the student choose. After finishing their own bread, next student were asked to choose how they wrap their maded bread.

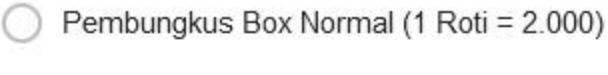

Fig 5.Wrapping Catalogue

Next, student count their own based price and BEP according to number of item they have choose from the previous section. Then the whole gamification process is finished, next student were given questionnaire to evaluate the gamification process.

3.2 Evaluation

First, before analyzing the questionnaire, the results from measuring BEP were also analyzed. The outcomes were categorized into two groups: right or wrong. "Right" means the student calculated the BEP correctly, while "wrong" means the student did not. The results can be seen in Figure 6 below:

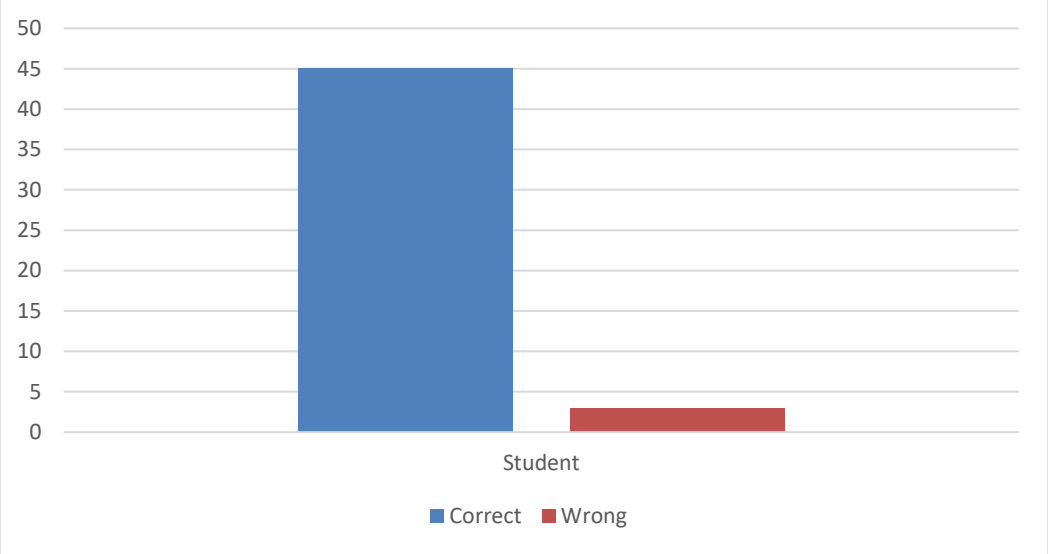

Fig 6.Result of the BEP Calculation

Out of 48 students, 45 (94%) correctly calculated their BEP, while 3 students (6%) got it wrong. This indicates that almost all students in the class understood the material, suggesting successful delivery of the content. To gain further insight, an analysis of the questionnaire responses is required.

The first question of the questionnaire asked whether the students had preliminary knowledge related to BEP calculation. The results of this question can be seen in Figure 7 below:

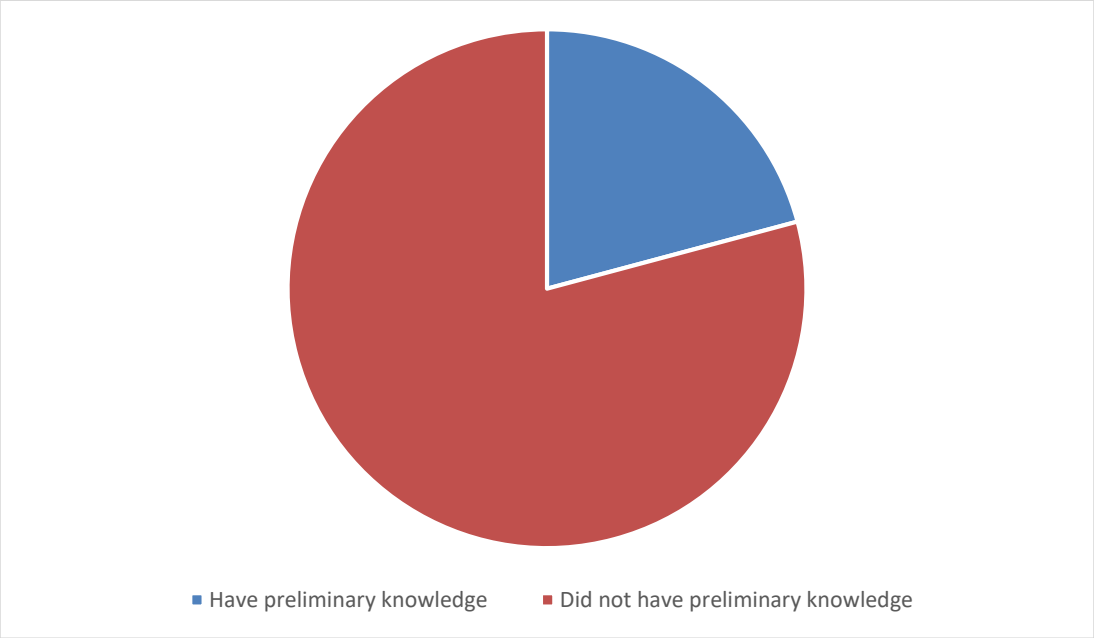

Fig 7.Result For Question "Do You Have Previous Knowledge About BEP?"

Out of 48 students, 10 declared that they had prior knowledge about BEP, either from previous schooling or independent study. Among these 10 students, 1 provided an incorrect BEP calculation, while the remaining 9 answered correctly. This means that 36 students(75%) learned BEP purely through the gamification process and successfully implemented it.

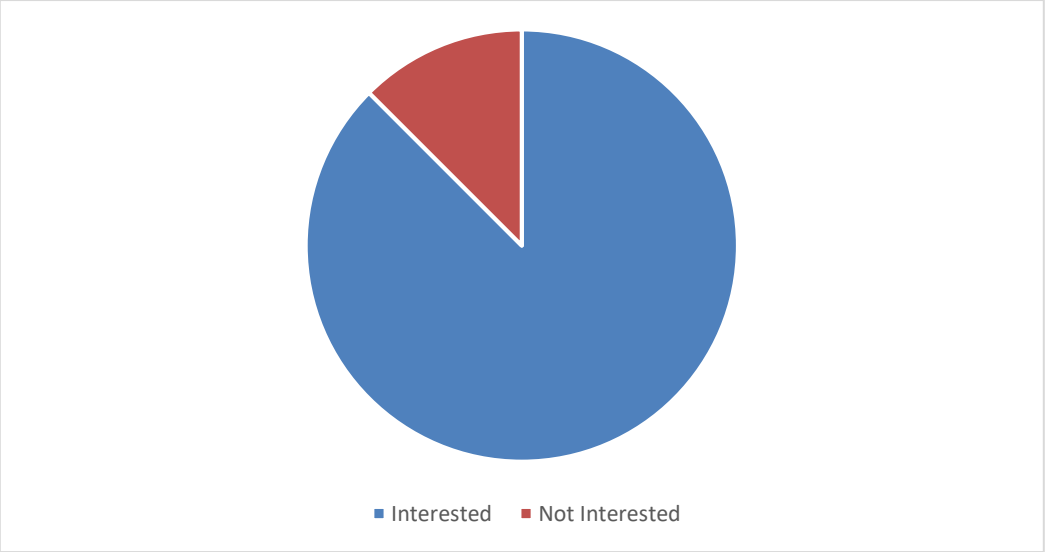

Fig 8.Result For Question "Do You Interested To Learn Using This Method?"

The result of the last question can be seen in Figure 8 above. The question asked whether the students were interested in learning using the same method in the future. Out of 48 students, a total of 42 students (88%) expressed interest in the gamification strategy, while the remaining 6 students (12%) preferred conventional strategies. Interestingly, all three students who previously did not correctly calculate the BEP were interested in the gamification method. This could indicate that while these respondents did not fully grasp the educational material through gamification, they still found the method engaging. Similarly, all ten students who already had prior knowledge related to BEP also agreed that the gamification strategy was interesting and engaging.

4. CONCLUSION

The conducted research shows promising results. Among the 48 student respondents, almost all (88%) agreed that implementing a gamification strategy indeed increased their engagement during the learning session, leading them to take a more active role. The results from the Break Even Point (BEP) test also yielded positive outcomes, with 94% of students correctly calculating their BEP.

For future work, it is highly recommended to implement gamification using a text-based delivery strategy to enhance student engagement in various courses. Additionally, the improvement of evaluation methods is also highly recommended. Currently, the evaluation of learning engagement is done through questionnaires; an advanced evaluation method with better capabilities to accurately reflect students' learning engagement could be a significant breakthrough.

CONSENT

All data collected from this research was handled with consideration for respondents' privacy. No real identities of the respondents were disclosed on this research paper.

Disclaimer (Artificial intelligence)

Author(s) hereby declare the usage of LLM (Large Language Model) AI in the form of:

1. ChatGPT 4.0 as proof reading tool for author's work. It is important to point out that the author did not use the LLM to fully generate any text for any part of the manuscript

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