



IMPLEMENTING GAMIFICATION TO IMPROVE STUDENTS' FINANCIAL
SKILLS IN BUSINESS AND MANAGEMENT VOCATIONAL SCHOOLS

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Abstract

The purpose of this research are to examine the effectiveness of implementing gamification to improve students' financial skills in Business and Management Vocational Schools. The design of this research is Classroom Action Research with two cycles, consisting of four stages, namely planning, action, observation, and reflection. The research subjects were students of Vocational Business and Management in Yogyakarta, Indonesia. Data collection method used consists of tests, documentation, and field notes. Data analysis using quantitative descriptive



analysis. The results showed that the average value of students' financial skills increased from 56.96 at pretest to 81.78 at posttest. Based on the Paired Sample T-Test test shows that there are differences in the average value of financial skills before and after the action. Thus, it can be concluded that the implementation of gamification can improve financial skills.

IndexTerms – Gamification, accounting, financial skills, vocational school

I. INTRODUCTION

Learning methods have a role as a tool for extrinsic motivation, as a teaching strategy and as a tool to achieve learning goals (Djamarah & Zain, 2013). The use of appropriate learning methods affects changes in student behavior during the learning process both in knowledge, attitudes, and skills. Business and Management Vocational Students face problems related to low financial skills. Financial skills in this study are skills in completing the accounting cycle.

Student motivation becomes one of the factors that influence student achievement (Lee, 2010; Al Othman & Shuqair, 2013; Long et al, 2013; Taurina, 2015; Chung & Chang, 2017; Bal Taştan et al. 2018) including skills (Bakar, 2014; Ahmed, 2016). Increasing student motivation is expected to improve students' skills. Learning methods can influence student motivation (Hanrahan, 1998; Harandi, 2015; Taheri et al, 2015). The use of appropriate learning methods can increase student motivation, which in turn will improve student skills.

Gamification can be used as a learning method that can increase student motivation. Gamification is defined by many as a way of using gaming principles in nongame contexts (Attali & Arieli-Attali, 2014; Werbach & Hunter, 2012, Brull & Finlayson, 2016). Gamification can increase student motivation (Buckely & Doyle, 2014; Sagoro, 2016; Papp, 2017; Sailer et al, 2017; Alsawaier, 2018). Gamification is one of the learning methods that can be applied in accounting learning. The use of gamification can improve student skills (Su & Cheng, 2014; Lister, 2015; El Tantawi et al, 2016). This research aims to improve student' financial skills through implementing accounting gamification model.

II. LITERATURE REVIEW

The use of gamification can increase attendance and participation, as well as motivation (Lister, 2015). However, this study still has limitations in seeing the gamification effect on student success and performance. Commonly applied gamification elements are points, leaderboards, badges, and levels (Khaleel et al, 2016; Kiryakova et al, 2014; Nah et al, 2014; Robson et al., 2015). Not all elements are used in each gamification study. The following are some gamification studies in various fields of education that have been carried out with the elements of gamification used. O'Donnell (2014) found that badges and leaderboards have gamification effectiveness in educational settings (O'Donnell, 2014). Santos et al. (2013) also used badges in the application of gamification to increase motivation. Similarly, Villagrasa & Duran (2013) used a scoreboard in the application of gamification to increase motivation. Based on the results of



previous studies, it is known that gamification can increase motivation. Which elements are most effective to use in gamification both partially and simultaneously still need be tested.

Besides increasing motivation, gamification can be used to increase student involvement in the learning process. De Freitas & de Freitas (2013) uses challenges in the application of gamification to increase engagement. Kumar & Khurana (2012) use levels, points, and badges to increase engagement. Based on the results of previous studies, it is known that gamification can increase involvement. Which elements are most effective to use in gamification both partially and simultaneously still need to be tested.

Increased learning motivation and student involvement in learning are expected to improve learning achievement. Previous studies have found that motivation is associated with learning achievement (Amrai, Elahi, Azizi, & Parhon, 2011; Sikhwari, 2014; Singh, 2011). Previous studies also found that involvement can improve learning achievement (Hughes, 2015). Previous research on the application of gamification to improve learning achievement has also been carried out. The application of gamification can improve learning achievement (Lister, 2015; Sagoro, 2016, Turan, 2016; Sahin & Namli, 2016; Yildirim, 2017). The application of gamification to the four gamification elements can increase motivation and involvement, so that the application of gamification can be more effective in improving learning achievement include student financial skills, especially in preparation of financial statements.

III. METHOD

This type of research is collaborative and participatory classroom action research, which means that this research is carried out by researchers who collaborate with accounting teachers. Classroom Action Research in its implementation has four stages, namely planning, implementing, observing, and reflecting. Researchers carried out research in 2 cycles using the model proposed by Suharsimi et al (2016).

The subjects of this study were Accounting students of Business and Management Vocational in Yogyakarta, Indonesia consisting of 34 students. This research was carried out in two cycles with four stages, namely planning, implementing, observing, and reflecting in each cycle.

Cycle 1

1. Planning

At this stage the activities carried out are to make an agreement with the teacher, drafting the lesson plan using Gamification, administering the required learning, preparing and preparing pretest and posttest questions, preparing matching questions, preparing group lists, prizes and prepare field notes.

2. Implementation

At the implementation stage the teacher conducts learning activities in accordance with the lesson plan. The implementation activities began with pre-tests, teacher presentations, dividing groups and discussing with groups. In the group discussion questions are given and answers to match up. The group will compete to complete the game by pasting the results on the answer



board according to the rules. Each question has a level of difficulty along with different points, where the points are accepted by the group if the answer is correct. Points collected are accumulated to the next cycle to get a winner. The winner will get a reward. After the next time out, students are given a posttest question.

3. Observations

Observations are carried out in conjunction with the implementation of actions or during the learning process. Researchers assisted by four observers to be an observer in this study will record all the things needed during the action.

4. Reflection

This stage is carried out after the research results are processed and analyzed. This reflection is used to assess activities that have been carried out and evaluate the implementation of these learning activities to be improved in cycle II. The results of this reflection are taken into consideration in planning learning for the next cycle.

Cycle 2

In the second cycle, the activities were almost the same as in cycle 1, but in the implementation phase in cycle 2 there was discussion with playing right wrong. The actions in cycle 2 were improved based on the results of the reflection of cycle 1 to achieve indicators of success.

Data Collection

Techniques of data collection in this study are as follows:

1. Test

The test in this study is used to measure financial skills of students' about accounting cycles in the form of pretest and posttest to determine financial skills student, before using Gamification. This posttest is also used to determine the increasing student' financial skills in cycle 1 and cycle

2. Field Notes

This field note is used to collect data about various aspects of the learning process, classroom atmosphere, teacher and student interaction and student interaction with students during the research.

3. Documentation

This documentation is a data collection technique collected by researchers in the form of activity photos, syllabus, lesson plans, student lists and student value lists that are used as a basis for group formation during the research implementation.

Data Analysis

Data analysis is by analyzing quantitative descriptive data with percentages used to analyze Financial Skills data. Data is processed based on data from pretest and posttest in each cycle. The processed data is then analyzed to calculate the improvement of Financial Skills by using the following formula:



$$Me = \frac{\sum xi}{N}$$

Information:

Me: average (Mean)

$\sum xi$: the sum of all values

N: number of individuals

(Sugiyono, 2012)

After obtaining the average student score, then calculating the percentage of student learning completeness with the following formula:

$$KB = \frac{T}{Tt} \times 100\%$$

Information:

KB: Completeness of Learning

T: Number of students who meet KKM (≥ 80)

Tt: Number of students taking the test

(Trianto, 2009)

IV. RESULTS

The implementation of the learning process by applying Gamification in cycle 1 and cycle 2 shows an increase in Student' Financial Skills. The data obtained in the first cycle and second cycle used for processing were only 28 students who participated in both cycles. To answer the action hypothesis, a discussion was made on Financial Skills after the implementation of Gamification. From the data obtained the average value of student' financial skills in Business and Management Vocational in cycle 1 and cycle 2 can be seen in Table 1.

Table 1. Average Value of Financial Skills in Cycle 1 and Cycle 2

information	Pretest	Posttest Cycle 1	Posttest Cycle 2
Amount of value	1595	2115	2290
Average Class Value	56,96	75,53	81,79

The average value of Learning Results in table 3 can also be seen in the picture below:

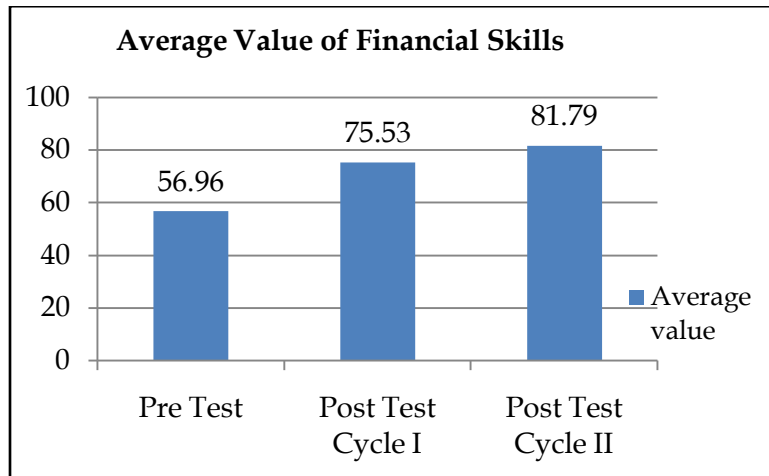


Fig 1. Average Value of Student Financial Skills

The following is a table of completeness of the Financial Skills in cycle 1 and cycle 2.

Table 2. Completeness of Financial Skills in cycle 1 and cycle 2.

Value Category	Complete Learning Outcomes		
	Pretest	PosttestCycle 1	PosttestCycle 2
Value < 80	89,29%	57,14%	17,86%
Value ≥ 80	10,71%	42,86%	82,14%

Based on table 1, it is known that there has been an increase in the average learning outcomes in the first cycle and second cycle after the implementation of the Gamification. The average value at pretest was 56.96 increasing by 18.57 or 32.60% to 75.53 then in the second cycle increased by 6.26 or 8.28% to 81.79. Increasing student' financial skills can also be seen from cycle I and cycle II. Based on these results it is known that the implementation of gamification can improve student' financial skills.

Based on table 2 it can be seen that there is an increase in the percentage of completeness of student financial skills from pretest to the second posttest. The percentage of students who reached minimal criteria in the pretest was 10.71% and then increased to 42.86% then in the post test cycle 2 it became 82.14%. In the post test cycle 2 students who reached the minimal criteria reached 82.14% or 23 students. Based on table 1 and table 2, it can be concluded that the implementation of Gamification can improve the student' financial skills.

Then another analysis is the calculation of the Paired Sample T-Test which is based on the financial skills of pretest and financial skills of post-test 2. The results of Paired Sample T-Test calculations calculated with the help of a computer program note that the value of Sig. (2-tailed) is 0,000, because Sig. (2-tailed) <0.05, which means that there is a difference in students' financial skills between pretest and post-test data which means that there is an influence of the implementation of Gamification in improving the financial skills for accounting students.



V. CONCLUSION

The implementation of gamification can improve the student' financial skills in Business and Management Vocational. The average value at pretest was 56.96 which increased by 18.57 or 32.60% to 75.53 then increased by 6.26 or 8.28% to 81.79. Completeness of student learning outcomes in the pretest was 10.71% then increased to 42.86% then increased again to 82.14%. In the posttest cycle 2 students who reached the minimal criteria reached 82.14% or 23 students. Paired Sample T-Test test results show that the Sig. (2-tailed) value is 0,000, because Sig. (2-tailed) <0,005 means that there are differences in students' financial skills between pretest and posttest data which means that Implementation of Gamification has an effect on improving Student' Financial Skills in Business and Management Vocational Yogyakarta, Indonesia.

Gamification should be used more often because it can improve financial skills or other learning goal, like a learning outcomes, motivation, engagement, etc. On the other hand gamification should not be implemented in a short time so that the learning process is more optimal. This is shown so that the teacher has time to deliver material and students have enough time for discussion and question and answer. For future research, it is better not only to examine financial skills, but also to examine student learning activities or student motivation.

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