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Gamified Flip Instruction to Improve Student Learning Outcome in Classroom

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Article Info

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ABSTRACT

Students' concept mastery skills in Simulation and Digital Communication lessons are still low. To solve the problem, an effective and efficient form of learning is needed, among others by choosing strategies and learning models that suit the abilities and needs of students and can create a fun learning atmosphere. The purpose of this study is to find out: 1) improvement of student learning outcomes in the application of gamified flip instruction type cooperative learning model, 2) effectiveness of student learning on the application of gamified flip instruction type cooperative learning model with expository learning. 1) There are differences in student learning outcomes using lecture learning methods in simulation and digital communication lessons and a signification of 0.81 (sig>0.05). Thitung value of 2,791 and ttabel of 1.66724 so that thitung obtained greater than ttabel (thitung > ttabel), 2) Improvement of learning outcomes using gamified flip instruction learning method is more significant than using expository learning methods. This is evidenced by the results of the gin test which showed that the increase in the experimental class was higher compared to the control class. Gain test results in the experiment class scored 44.4 while the control class scored 24.5. The experiment class falls into the medium category and the control is in a low category.

Keywords: cooperative; gamified flip instruction; learning
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1. INTRODUCTION

Challenges in the 21st century, Kemendikbud made breakthroughs to improve the quality of education to produce graduates who are ready to compete globally in the future. One of those early breakthroughs was by implementing the 2013 curriculum. In other words, the implementation of the 2013 curriculum is intended to answer about the age of education, namely to produce graduates who are competitive, innovative, creative, collaborative, and characterful. To achieve this final orientation, it is realized that education is not only done to develop knowledge based on the core subject of learning but also must be oriented so that students have creative, critical, communicative skills as well as character.

The challenges that teachers need to face in the 21st century, every teacher should have high skills and professionalism. The challenges facing teachers in the 21st century no longer revolve around students' academic abilities, but rather on students' intellectual, emotional, moral, and moral education. The era of globalization demands high competition without exception for all human beings. There is no other option but to face this complex century. Professional teachers of the 21st century are not teachers who are simply able to teach well. Professional teachers of the 21st century are teachers who can become career-long learners to improve the effectiveness of the student learning process along with the development of the environment, can communicate both directly and use technology effectively with parents to support the development of the school. The same is required for teachers in Indonesia through Law No. 14 of 2005 concerning Teachers and Lecturers Article 6 which reads:

The position of teachers and lecturers as professionals aims to implement the national education system and realize the purpose of national education, namely the development of the potential of learners to become human beings who believe and fear God Almighty, noble, healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens.

Professional teachers are required not only to have teaching skills as required in pedagogical competency standards, but teachers must also be able to develop professionalism continuously as stated in professional competencies. Teachers are also required to be able to establish 3 effective communication with fellow teachers, educational personnel, parents, and the community as required in social competence and have a good personality as described in personal competence. In addition, teachers must also have an adequate educational background and be relevant to their teaching field.

The development of the 2013 curriculum is part of a strategy to improve educational achievement. In addition to the curriculum, there are several factors to improve educational achievement including the length of time students attend school; long time students stay in school; competency-based active student learning; handbook, and the role of teachers as the spearhead of education implementation. Quoted from Trianto (2014: 5) the orientation of the 2013 curriculum is the improvement and balance between attitude, skill, and knowledge competencies. Therefore, the learning process that was originally focused on exploration, elaboration, and confirmation is focused on fostering attitudes, skills, and knowledge through the application of the right learning model. In line with this fact, the learning process not only occurs in the classroom, but also in the school environment and the community. Therefore, in learning that implements the 2013 curriculum, teachers are not the only learning resource. In the attitude dimension, attitudes are not taught verbally, but by example, habituation of activity, and example.

Internet technology that is developing in the world of education has risen rapidly and brings a lot of influence to the world of education society, especially teachers and students. For example, the number of e-learning that has sprung up at this time makes it easier for students and teachers to interact outside the classroom more effectively.

Vocational High School (SMK) is an educational institution that prepares students to be able to work in certain areas of expertise. Vocational Education is directed to study special fields so that graduating students have certain skills and to develop their careers to work more productively Form a formal educational unit in the implementation of further education from junior high school, MTs, or other equal institutions. According to Article 26 Paragraph 3 of Government Regulation No. 19 of 2005, the standard of graduates in vocational secondary education units aims to improve intelligence, knowledge, personality, noble morals, as well as skills to live independently and follow further education according to their majors.

Related to the issue of education has been mentioned national purpose in the law of the Republic of Indonesia No. 20 of 2003 Chapter 11 article 3, which reads as follows:
"National education serves to develop the ability and form the character and civilization of the nation and dignity to educate the life of the nation, aiming to develop the potential of learners to become human beings who believe and fear God almighty, noble, healthy, knowledgeable, capable, creative, independent, and become citizens of a democratic and responsible State"

Thus, national education seeks to develop all human potential in cognitive, affective, and ranapsikomotoric spheres. To start flipping classrooms, instructors must fundamentally start recording lessons using various video software or video cameras. Later, various software can be used to edit videos. Furthermore, videos are distributed to students through various platforms, such as the Learning Management System (LMS), Blogs, Wikis, and social media. Special devices can be used, for example, Panopto, Tegrity 9, Screencast-o-Matic, Camtasia Studio 9, Wikispaces, Evernote, Schoology, and Edmodo.

The Gamification learning model can be interpreted as fun learning and encourage students to be more active in the classroom and outside the classroom, encourage students to be more focused and understand the material being studied by students, allowing students to competently explore and excel in the classroom.

The initial observations made at SMK BATUR JAYA 1 Ceper related to the implementation of Simulation and Digital Communication learning found some real conditions, such as the following: (1) the teaching materials used by teachers are limited to textbooks, (2) the learning strategies used are centered on the orientation of teacher delivery (teacher-centered), (3) the allocation of time for Simulation and Digital Communication subjects is very limited, which is 90 minutes per week. In addition, the learning conducted in the classroom is still somewhat less interested due to the lack of stability when teaching, the number of students who are too active in the classroom but tend to look at other things, tend to listen less to others. especially the number of books that must be studied by private students and the lack of learning in the classroom. These limitations can be an inhibitory factor for learning that requires problem-solving. This can be seen from the students' learning results can be seen in Table 1. as follows.

Table 1. Results of Daily Deuteronomy of Students in Simulation and Digital Communication subjects of the 2019-2020 School Year

No	KKM	Class	value (X)		Total
			value < 70	value ≥ 70	
1.	70	A	26	5	31
2.	70	B	25	6	31
Total			51	11	62

Source: Value documentation in teachers Simulation and Digital Communication Subjects, class X-TITL SMK Batur Jaya 1 Ceper

Based on Table 1.1 above, the results were obtained that students who obtained learning outcomes above KKM were 11 out of 62 (17.7%) students, while those who obtained learning outcomes under KKM were 51 out of 52 (82.3%) students. Based on these values, it can be said that the ability of the student concept is still relatively low. This happens because so far students only record the material without being read and understood again, memorizing the material, and less practicing the problem with a variety of questions.

Based on the description above and the results of daily test scores can be concluded that the ability to master the concept of learners in simulation and digital communication lessons is still low. To solve the problem, an effective and efficient form of learning is needed, among others by choosing strategies and learning models that suit the abilities and needs of students and can create a fun learning atmosphere. One of the steps to solve learning problems according to Sugin, et al., (2020), is to develop an interesting learning system design concept. Setyosari &Sihkabuden explained that to create interesting learning, teachers can make several efforts such as (1) increasing the commitment to efforts to improve the quality of learning, (2) designing systematic and structured learning, (3) utilizing technology and learning media in carrying out the learning process.

Solutions according to Sams &Bergmann, which is used by teachers to solve problems related to student participation and learning outcomes in X-TITL classes in the learning process Simulation and Digital Communication application of gamified flip instruction learning model is the right learning model, this type is a combination of gamification learning mode and flip classroom instruction is often associated synonymous with using video to replace conventional classroom lectures (Sugin, et al., 2020).

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2. RESEARCH METHOD

This study used the true-experiment research method, to investigate possible causal relationships by giving treatment to one or more experimental groups, and then comparing them with control groups that were not treated (Sumardi, 2016). The experimental classes in this study were treated in the form of the application of a flip class instruction type cooperative learning model, while the control class was not treated. This experimental research method uses quantitative data analysis to test hypotheses. Pretest-postest control design research design, includes experimental groups and control groups that have the same characteristics. The population in this study includes all students of class X-TPL SMK BATUR JAYA 1 Ceper school year 2019/2020 which amounts to 70 students. The samples in this study used a cluster sampling technique. Two classes as research samples are X-TITL A as experimental class and X-TITL B as control class.

The data collection techniques used in this study used test results. Instruments or measuring instruments used in this study are in the form of test instruments. Instrument test obtained from the results of students' learning about the material taught, in the form of objective tests that were previously tested and analyzed to obtain the validity of the question, the degree of difficulty of each item of the question, different power, distract (distract) and reliability of each item of the question to meet the criteria specified earlier.

Data analysis techniques use prerequisite tests between normality tests, and homogeneity, as well as hypothesis testing using an independent sample t-test on SPSS to find out how the learning results are compared to the flip class instruction type cooperative learning model and expository learning model, as well as testing the differences in improved learning outcomes before and after the learning process according to each treatment.

3. RESULT AND ANALYSIS

The prerequisite test of the analysis was conducted before the data analysis stage then held several test praysarat were used for withdrawal from this study. This data test is data on improving student learning outcomes by looking at pretest and posttest grade control scores as well as experimental classes.

Here are some of the pre-conditions in this study:

Result

1) Normality test

The normality test aims to find out if the data in the study is distributed normally or not. Test the normality of the data or conclude the data used in the form of pretest and posttest scores of students who are samples from both classes. In this case, use Kolmogorov-smirnob with the help of spss to determine the normality test of the data obtained. The data in this study is said to be the normal distribution, when signification data is more than 0.05. Instead, the data is said to be normal when the signification data is less than 0.05. The results of the normality test in this study are as follows:

Table 2. Normality test

Instrumen Learning Outcomes	Class	sig-kolmorogov	Conclusion
Pretest	control class	0,165	normal distribution
	experiment class	0,82	normal distribution
Posttest	control class	0,66	normal distribution
	experiment class	0,20	normal distribution

According to the normality test table, the test value data of the control class and experiment on the pretest and posttest values is said to be normal because the data signification value is greater than 0.05.

2) Homogeneity test

Homogeneity test in this study using levenes test where money data can be said homogeneous must have a signification value of > 0.05, if the data has a signification of <0.05 then the data is not homogeny. In the results of this research homogeneity test are as follows:

Table 3. Uji Homogenitas

Instrument Learning outcomes	Sig.Lavenes	Conclusion
Pretest	0,380	sample homogen (sig.>0,05)
Posttest	0.814	sample homogen (sig.>0,05)

From the homogeneity test table above it can be said that the value of pretest and posttest of experimental and control classes is homogeneous because the data signification value is greater than 0.05.

Hypothetical test results, This test is conducted after conducting a prerequisite test of normality test analysis and homogeneity test. Data from the test will then be used for hypothesis testing. In this study there are 2 hypotheses are as follows:

1) The First hypothesis

In the first hypothesis test, it was seen whether the difference in student learning outcomes between control classes using expository learning methods and experimental classes using gamified flip class instruction learning methods. This test uses an independent sample t test with a signification value of $\alpha = 0.05$ where thitung>ttabel. The results of the first hypothesis test are as follows:

Table 4. First Hypothesis Test Results

Variable	control class	experiment
Number of students (N)	35	35
Significance		0,81
t_{hitung}		2,791

Based on the table above can be seen there is a company of student learning results control and experimentation with a signification value of 0.81 (sig > 0.05). Obtained a calculated value of 2,791 and a table value of 1.66724 so that the value of thitung is higher than the value of ttabel (thitung>ttabel). The results showed that there were significant differences in learning outcomes between the control class and the experimental class. So it can be declared Ho rejected and H1 accepted.

2) The Second hypothesis

The second hypothesis test was conducted to determine the effectiveness between the results of gamified flip class instruction learning methods and expository learning methods.

For this test use gain test with the following results:

Table 5. Gain Test Results

Variable	control class	experiment class
Number of Students (N)	35	35
Mean score (g)	24,5	44,4
Minimum score	0	0
Maximum score	100	100

Based on the test results that advanced mark gain (g) in the experimental class is greater than the control class (44.5>24.5) then there is an increase in the learning result of students in the experimental class is better than the control class, so that H0 is rejected and H1 is diteruma. So it can be said that there is the effectiveness of the results of learners who use gamified flip instruction learning methods.

Analysis

Technology that develops a lot of impacts in the area of the education sector, with technology is very helpful to educate workers about the development of materials and how to deliver better materials to students. With the help of technology can also learn anywhere and anytime.

Research on the influence of gamified flip instruction learning model to improve student learning outcomes in X TPL class. This study used cluster sampling. While the research method used is a true-experiment research method which will be used to compare between experimental classes that use gamified flip instruction learning methods and control classes that use expository learning methods. The data seen is the data of student learning outcomes that are corrected through pretest and posttest from both classes.

In the validation test, there are pretest and posttest questions where the question is tested to students of grade X TKJ with a total of 30 questions. Thus there are valid questions as many as 22 items to use and taken 20 items used for pretest and posttest questions. The reliability rate of pretest and posttest problems is 0.865.

The implementation of this research was conducted at SMK Batur Jaya 1 Ceper Klaten. This study was conducted as many as 6x hours of lessons in each class X TPL. There are two sample classes, namely 35 students of class X TPL A as experimental class and 35 students of class X TPL B as control class. Before the treatment or treatment is carried out pretest with the weight of the same question to know the initial ability of students to the material to be studied.

At the first meeting obtained pretest results from both classes. The average pretest result is used to determine the treatment used in each class. The average value of the control class is 61.29 while the average value of the experiment class is 59.86. So judging from the average value of both classes has not met the value of graduation criteria. Where the value of the graduation criteria is at the value of 75. Thus students have not been able to prepare for subject matter judging from the pretest results.

In the second meeting was conducted treatment where teaching and learning activities to students (samples). The experimental class uses gamified flip instruction learning method while the control class uses the expository learning method (lecture). The second meeting for the first material delivery experiment class was conducted through google classroom while the control class did not use google classroom.

After treatment in each class, then the meeting of the three students was given posttest with the same question to find out if the students can understand the material that has been delivered. In the third meeting obtained posttest values of both classes where the class TPLA (experimental class) got an average score of 78.86, while for the value of class TPL B (control class) got an average score of 71.43.

To find out the difference in learning outcomes between experimental and control class students of the posttest and posttest values as evidenced by the first hypothesis test using independent T test by looking at greater thitung or ttabel. If thitung is greater than ttabel, then ha is accepted and it can be stated that there are differences in student learning outcomes. Based on the results of the posttest value can be seen signification of 0.81 (sig>0.05) and thitung of 2.791 and a ttabel of 1.66724 (thitung > ttabel). So that it can be known the difference in learning outcomes between the experiment class and the control class. The second hypothesis test is done by using a gain test for both classes. In the experiment class, a score of 44.4 was obtained and the control class scored 24.5. Experiment classes fall into the medium category and control classes fall into the low category.

The initial stage of this research is to conduct instrument testing. Then entrust the treatment to each class. For experimental classroom learning activities use gamified flip instruction learning method while control class uses expository learning method. The application of the experimental class begins by providing instructions and views on what is gamified flip instruction which will use google classroom as a delivery of material sent

before the lesson begins and use doubling at the beginning of the meeting to make the delivery of the material more enjoyable, while in the control class using the module provided by the teacher.

Thus, it can be concluded that gamified flip instruction learning method influences students' learning outcomes because there are differences in learning outcomes and improved student learning outcomes between the experiment class and the control class. Thus, the learning method of gaming flip instruction makes the delivery of material easier to understand by students.

Analysis on students, the results of observation of student analysis obtained the following data. First, the student's initial ability: a) the student is familiar with technology in terms of the operation of gadgets or computers, b) the student already knows and uses the media in other subjects, c) the student is accustomed to connecting with the internet access, d) the student knows the prior knowledge of the material to be taught.

The second relates to the student's learning style when learning; a) students tend to like collaborative and group learning, b) students prefer to learn using computers or other gadgets, c) students love fun learning.

Third characteristics of Students: a) students consist of heterogeneous groups, of different ethnicities, with an age range of 16-17 years, b) students are used to self-study, c) students are familiar with internet use, d) some students prefer to study independently and some groups of choice, e) students still study under the direction of the teacher as f) student learning in learning is not the same as the whole, different motives in following the learning process.

Furthermore, related to the use of learning methods or strategies based on gamified flip instruction learning, can be described as follows. A few days before the class, the teacher invites students to learn virtual class materials. In this virtual classroom activity, students can access the learning modules and videos that have been uploaded. Furthermore, when classroom learning is conducted, the teacher no longer explains the material from the beginning but invites students to analyze the material they have learned and then continue with the practice.

The results of this study are in line with Kusnandar's opinion, gamified flip instruction is a teaching technique that transforms traditional teaching culture into media form. For example: a teacher who explains the material on the board takes hours so students tend to get bored. While gamified flip instruction renovates it by recording learning in the form of the video so that children will watch it at home (Kusnandar, P, 2017). gamified flip instruction has the basic concept that what is done in the classroom on conventional learning becomes done at home, while homework on conventional learning is done in the classroom (Milman, 2017).

In this lesson, students watch the learning videos provided by the teacher at home to find their concepts of the lesson material according to their understanding. While in class, students have time to work on assignments, practice questions, projects, or discussions of materials from videos learned in advance. So that students not only get learning in the classroom but outside the classroom students can also access or view the materials provided by the teacher repeatedly.

Nick Pelling first used the term in 2002 at a presentation at the TED (Technology, Entertainment, Design) event. In Prambayun research (2015), Gamifikasi is using game mechanics to provide practical solutions by building the engagement of certain groups. In more detail, Kapp defines gamification as a concept that uses game-based mechanics, aesthetics, and game thinking to bind people, motivate actions, promote learning and problem-solving. In its development, gamification is widely applied to business activities, marketing, health, learning, and so on. Applying gamification in learning is expected to provide triggers or motivation to students to follow the teaching and learning process because the process is interesting and fun (Takdir, M, 2017).

With motivation, students can develop activities and initiatives and direct and maintain perseverance in learning activities. Based on the description above, the motivation of learning is the overall power or drive that comes from within the student (intrinsic motivation) or from outside the student (extrinsic motivation) to give rise to learning activities, which ensures the continuity of learning activities and provides direction to learning so that the desired goals by the learning subjects can be achieved. There are several elements of gamification that can be applied in learning. Arif Prambayun and Mohamad Farozi (2015) explain gamification elements, including story/mission, Challenge, Reward (Points). Meanwhile, according to Meyhart, some things about the game elements are such as points, badges, levels, progression, feedback, to-do lists, and social graphs by learning from video games (Takdir, M, 2017).

After applying gamified flip instruction learning method in learning Simulation and Digital Communication in the classroom it turned out that the response of students was amazing. Several things show motivational indicators in students' Simulation and Digital Communication learning improved among others:
1. Simulation and Digital Communication lesson hours are anticipated by students. This is a rare event. If usually the hours of Simulation and Digital Communication become boring or burdensome lesson hours for students, then this time the students are looking forward to this lesson hour. Students enthusiastically ask questions and prepare for Simulation and Digital Communication learning.

2. Students ask for the number of exercise questions to be added. It's amazing. If it is usually a matter of exercise given only 3 numbers and it is considered burdensome. After applying gamified flip instruction, this time it was the student who asked that the number of questions in the form of monsters is added. This has increased their motivation and curiosity in learning Simulation and Digital Communication and getting used to them working on more practice questions.
3. Students feel the duration of learning Simulation and Digital Communication feels short. This is certainly different from before where sometimes students learn Simulation and Digital Communication while keeping an eye on the wall clock, restless, and hoping that the math lesson hours will end soon. After applying gamified flip instruction, students feel a different learning experience. Students enjoy the learning process so that the lesson hours feel short.

4. CONCLUSION

1. There are differences in student learning outcomes using lecture learning methods in simulation lessons and digital communication. And signification of 0.81 (sig>0.05). Thitung is 2,791 and ttabel is 1.66724 and thitung is greater than ttabel (thitung > ttabel). The results showed that there was a significant difference in learning outcomes between the experimental class and the control class. So it can be declared H0 rejected and H1 accepted. In the results of the study, there is a difference between using gamified flip instruction method and the expository learning method.
2. The improvement of learning outcomes using gamified flip instruction learning methods is more significant than using expository learning methods. This is evidenced by the results of the gin test which showed that the increase in the experimental class was higher compared to the control class. Gain test results in the experiment class scored 44.4 while the control class scored 24.5. The experiment class falls into the moderate category and the control is in a low category, from the results it can be concluded that there is the effectiveness of learning outcomes using gamified flip instruction learning methods. There are also differences between classes that use gamified flip instruction methods and classes that use lecture methods in simulation lessons and digital communication.

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