

IMPLEMENTATION “GUESS MATH OPERATIONS” GAME TO IMPROVE STUDENTS’ MOTIVATION IN COMPARING MATERIALS AT SEVENTH GRADE MTS SARJI AR RASYID

Ida Fitriana Ambarsari^{1*}, Nur Hasanah², Miftahus Surur³

^{1,2}Mathematics Education Study Program, STKIP PGRI Situbondo, Jl. Argopuro Gg. VII, Situbondo, Indonesia

³Economic Education Study Program, STKIP PGRI Situbondo, Jl. Argopuro Gg. VII, Situbondo, Indonesia

ABSTRACT

This study was intended to describe the implementation of “guess math operations” game designed to improve students’ motivation to solve comparison problems. The study was conducted at MTs Sarji Ar Rasyid at seventh grade with 25 students as its subjects. Type of the study is Classroom Action Research. The number of cycles was two, and each cycle consisted of two face-to-face meetings. In this study, the researcher investigated the implementation of teaching activities and impact toward students motivation in solving math problems, especially in solving comparison problems. Accordingly, the collected data were the description of how the researcher implement: apperception, presenting learning objectives, motivating students, presenting students worksheet, and encouraging students playing the “guess math operation” game. The other data was students’ motivation in solving math problems, in this research was comparison problems. Data were collected through the use of observation, field notes, questionnaire, and interview. Using qualitative technique of data analysis, it can be concluded that to improve students’ motivation in solving comparison problems, there are two things that should be taken into consideration. The results of this research obtained good results and almost all the success criteria were achieved.

Keywords: “guess math operations” game; students’ motivation

1. Introduction

Most students said that mathematics is a difficult subject to understand, scary, and also boring. The causes of student difficulties are due to many things, namely because mathematics is taught theoretically which makes it difficult for students to understand and mathematics is difficult to understand because learning in schools carried out by teachers tends to be monotonous and conventional in conveying a material. Learning in schools that have been carried out by teachers so far are: (1) teachers explain, (2) teachers give examples and work on them, (3) give questions to students, (4) do tests.

The learning that teachers have done so far has made students undeveloped and difficult to understand mathematics which is an abstract subject and makes students not interested or assumed that mathematics is an unpleasant subject.

During the learning process, the teacher will give questions on the blackboard or give questions in the form of Student Worksheets (LKS) to find out students’ understanding of the material being studied in class, but the facts found in class if the teacher gives questions on the blackboard and appoint one student to solve it, other students feel bored and do not work on the questions given by the teacher but they do other activities even sleep or talk to their friends. This also happened in class VII at MTs Sarji Ar Rasyid.

This situation shows that students lack motivation in learning mathematics and the teacher’s failure to achieve the goal for students to

^{*)}Corresponding Author.

E-mail: ifa643@gmail.com

Phone: +6285783768830

solve problems in order to determine student understanding. Students feel bored and not interested in solving the problems given by the teacher and cause class conditions to be not conducive. Students need new conditions that can encourage them to be motivated to learn mathematics. Based on the problems that occur at MTs Sarji Ar Rasyid, the appropriate alternative is to carry out game-based learning or games.

Motivation is a psychological symptom in the form of encouragement that arises in a person both consciously and unconsciously to take an action with a specific purpose (Islamuddin, 2011). Motivation plays an important role in the learning process, motivated students are students who have motive to learn, they will listen and pay attention to achieve success and become responsible students, for example a student will solve math problems given by the teacher because of willingness and not by coercion from the teacher (Idris, 2005). Someone is said to have high motivation, it can be interpreted that the person has a very strong reason to achieve what he wants by doing his current job (Uno, 2006). What happened at MTs Sarji Ar Rasyid shows that students feel unmotivated to learn mathematics because they think mathematics is not fun, students unmotivated to give their best to learn mathematics, so to improve students' motivation in solving problems, the authors try to looking for an alternative to solve the problem. Purnama et al, (2019) also concludes that students actually have motivation to learn, but teachers must be more creative in using media, strategies, or ways of delivering material in learning activities to improve students' motivation. In another article (Black, 2013), it was concluded that student learning motivation is the responsibility of the teacher even though the student was unmotivated to learn at first.

The purpose of the instructional games model is to provide learning experience that provides learning facilities to improve students' abilities through the form of educational games (Rusman, 2012). So, in general, by implementing games in the classroom for educational purposes, benefits can be obtained, namely, the learning process is more interesting, more interactive, the quality of teaching can be improved, students become happier, not bored in class so that students are motivated to continue learning and make teachers can achieve the goals in the learning. In the journal Permana et al, (2014) which contains research on computer-based interactive

educational games, it is explained that the instructional game model applied in the classroom can be used as a learning tool to attract students' interest in learning and support the learning process.

As explained in Hasanah's thesis (2010), that games are not only for fun or just a waste of time but games can change learning to be easier, more potential and no longer boring. Games as we know are fun and can make people who play them happy. The games that exist today have various types or what are known as genres, one of which is an educational game. This concept is intended to be applied in the classroom so that students feel happy in class and are no longer bored and can improve students' motivation to solve problems given by the teacher.

Game usually not only contains fun things but also the existence of a challenge or goal that must be achieved by the player of the game. Challenges like this make the game more interesting and preferred by many people. According to Jason in the journal Aprilianti (2013), the game is a system or program in which one or more players make decisions through control of objects in the game for a specific purpose. Challenges in a game can make people more motivated to complete a game, as well as games if applied in the classroom for educational purposes, it can improve students' motivation to learn and solve problems or problems given by the teacher as expressed by Arsyad (2011) that a well-designed game program can motivate students and improve their knowledge and skills. Based on the problems that occurred in class VII at MTs Sarji Ar Rasyid, an innovation learning is needed so the mindset of students towards mathematics subjects changes and become fun. One solution to these problems, namely the application or implementation of "guess math operations" game, so learning mathematics becomes fun and learning objectives can be achieved.

This research is expected to make students like mathematics and change the mindset of students about mathematics subjects. Such that, mathematics becomes a fun subject and students are interested in learning it. Thus, mathematics teachers can benefited, students gain new knowledge about mathematics, and mathematics learning objectives can be achieved jointly by teachers and students.

2. Research Methods

Type of this research is qualitative research. Referred to qualitative method because of the collected data and the analysis is qualitative. Qualitative research methods named as interpretive method because the result data of research more regarding with interpretation to the data found in field. Qualitative research methods also often called naturalistic research method because research conducted on natural condition. This research conducted on natural object. Natural object is object that develops as it is, no manipulated by researcher and presence of the researcher does not really affect the dynamics of the object. Approach used in this research is classroom action research.

The aim of this research for collect data from implementation of “guess math operations” game to improve students’ motivation to solving comparison materials at seventh grade MTs Sarji Ar Rasyid, so the data obtained in the form of qualitative data as result of implementation of “guess math operations” game to improve students’ motivation to solving comparison materials at seventh grade MTs Sarji Ar Rasyid. This research prioritizes the result of the implementation of “guess math operations” game, so that approach used is classroom action research. Following chart illustrating the design of classroom action research (Arikunto, 2010):

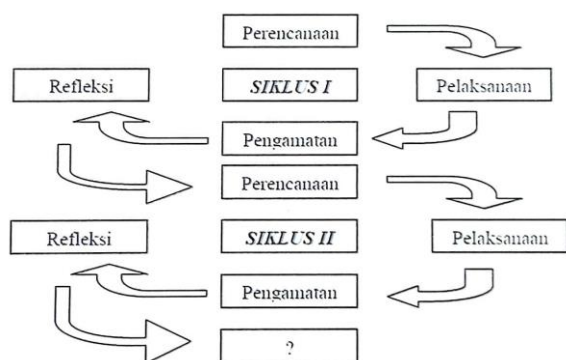


Figure 1. Design Chart of Implementation of Classroom Action Research

Furthermore, data analysis used is qualitative descriptive analysis that use on result of observation, fill out the questionnaire, and interview. Data analysis is carried out during process data collection and after process data collection. Data analysis carried out on this research, includes analysis teacher and student activities, students motivation, students respon,

and explanation of implementation of “guess math operations” game in the class.

Explanation data of implementation of “guess math operations” game in the form of steps or instruction implementation of “guess math operations” game carried out during the research. Following the steps or instruction of the game. (1) Forming a group of 4-6 students, (2) This game is divided into two, namely the first game is a math game to improve students’ motivation in solving math problem, especially comparison material, meanwhile the second game in the form of math problems to measure student learning success in the class, based on the material being discussed. (3) The first game in the form of crossword puzzle with a number of box containing number and empty box must filled with addition (+), subtraction (-), multiplication (\times), or division ($:$) operation and equal to (=), so become a true statement based on math rules. (4) after answer a question correctly in the first game, then student could continue to finish the second game with the same number. (5) If student succeed answer the question on the second game, then student declared succeed answer the question on the number and gain a value.

3. Results and Discussion

a) Questionnaire

Questionnaires were distributed to 25 students’ of seventh grade, they filled the questionnaires during their normal class session which time they were given clear instructions and explanation. Questionnaire consists of 6 multiple choices and 2 short answers.

Table 1. A list of questions

No.	Questions
	Multiple Choices
1	When the teacher implemented “guess math operations” game, you feel learning mathematics becomes fun. What do you feel?
2	During implementation of “guess math operations” game, you can easily solve a problem. What do you feel?
3	During implementation of “guess math operations” game, you have difficulty solving a problem. What do you feel?
4	How do you feel when you solve math with “guess math operations” game?
5	When the teacher implemented “guess math operations” game, you are more interested in learning math. What do you feel?

6	When the teacher implemented “guess math operations” game, you are motivated to solve the math problem. What do you feel?
Short Answers	
7	What is the difference between solving maths with “guess math operations” game and learning math as usual?
8	What is your choice between learning math as usual or learning math with “guess math operations” game?

Table 2. Percentage (%) of the result from the questionnaire of students’ motivation to solve comparison problems.

Number of Questions	I Strongly Agree	I Agree	I Disagree	I Strongly Disagree
1	11 (44%)	14 (56%)	(0%)	(0%)
2	6 (24%)	11 (44%)	7 (28%)	1 (4%)
3	5 (20%)	6 (24%)	11 (44%)	3 (12%)
4	21 (84%)	3 (12%)	1 (4%)	(0%)
5	8 (36%)	13 (52%)	1 (4%)	2 (8%)
6	11 (44%)	13 (52%)	1 (4%)	(0%)

From the data above, the researchers concluded that most students have motivation to solve comparison problems after implementation of “guess math operations” game. It was provided with the percentage of strongly agree and agree, higher than percentage of disagree and strongly disagree, vice versa. Furthermore, from the calculation answered by students in this questionnaire, the researchers discovered that most of students have a motivation solve comparison problems. It indicated that students of seventh grade at MTs Sarji Ar Rasyid has highly (good) motivation after implementation of “guess math operations” game.

Furthermore, from questions with short answer, we know that most of students said that they enjoy to learning math and solving math problems, especially on solving comparison problems. They said learning math with “guess math operations” game more fun and enthusiastic than learn math as usual because like playing while learning.

b) Interview

Interview session was conducted after all respondents filled the questionnaires. The authors took two female respondents and two male respondents as a representatives of the class. The author asked to the respondents about their motivation. The outcome of the interview represented that the learners were motivated, because the learners feel that the “guess math operations” game was fun and an interesting game.

Next, the author asked to the respondents about students focus to solving math problems. The outcome of the interview represented that the learners was more focus and enthusiastic when learning with “guess math operations” game.

Then, the author asked to the respondents about how the game affect their motivation to solve math problems, especially on solving comparison problems. The outcome of the interview represented that the learners was motivated to solve math problems, because the learners feel challenged to solve the “guess math operations” game with friends and new to them, so learning math and solving math problems not boring and fun.

c) “Guess Math Operations” Game Worksheet

Following sample of filling out the “guess math operations” game worksheets

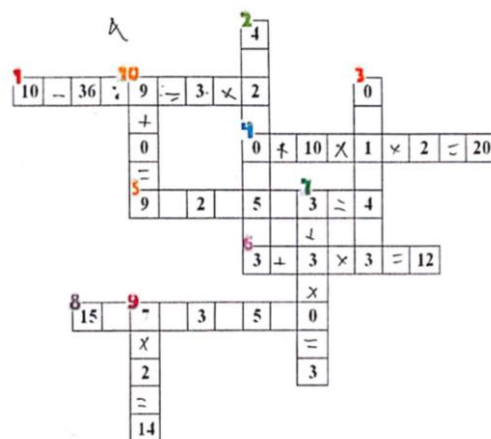


Figure 2. The First Game (Crossword Puzzle)

SOAL!

Jawablah soal berikut ini dengan benar setelah menyelesaikan teka teki terlebih dahulu!

1. Satu dari empat siswa kelas VIIA suka membaca novel. Tentukan perbandingan dari pernyataan tersebut! 1 : 4
2. Fatimah mengendarai mobil dari Surabaya ke Situbondo dengan kecepatan 45 km/jam. Diketahui jarak Surabaya dan Situbondo pada peta 5 cm dengan skala 1:1.200.000. Fatimah sampai pada pukul 09.10 dan Fatimah sempat istirahat selama 25 menit. Pukul berapa Fatimah berangkat?
3. Kepala sekolah MTS Sarji Ar Rasyid merencanakan perbaikan kelas dapat diselesaikan dalam waktu 30 hari dengan 20 pekerja setelah dikerjakan 15 hari ternyata pekerjaan harus dihentikan selama 5 hari jika setiap pekerja tambahan dibayar Rp. 100.000 per harinya maka tentukan banyaknya pekerja tambahan dan besar biaya yang dikeluarkan kepala sekolah?
4. Jumlah uang Via dan Amel Rp 28.000,00. Perbandingan kelereng Via dan Amel 3 : 4. Berapa uang Via? Rp. 12.000
5. Perbandingan teh dan gula = 2 : 3. Misal banyak teh yang digunakan adalah x gr dan gula 300 gr. Berdasarkan perbandingan tersebut tentukan nilai x!
6. Jarak kota a dan b pada peta adalah 5 cm. Jika skala peta 1 : 300.000. Berapa jarak sebenarnya kota a dan b? 2,4 km
7. Seorang arsitek menggambar sebuah bangunan dengan ukuran 40 cm x 50 cm. Jika skala yang direncanakan 1 : 40. Berapa luas bangunan yang sebenarnya? 320 m²
8. Perbandingan yang paling sederhana dari 3 kodi : 3 lusin adalah ...
9. Perbandingan banyak siswa laki-laki dan perempuan kelas VII adalah 7 : 5, jika jumlah siswa kelas VII seluruhnya 36 orang, banyak siswa laki-laki adalah ... 21
10. Perbandingan antara banyaknya spidol merah dan biru di sebuah gudang yaitu 4:7. Jika selisih kedua jenis spidol tersebut adalah 12. Tentukan banyak spidol biru! 28

Figure 3. The Second Game (Comparison Problems)

4. Conclusions

Motivation is the influential factor in learning activity. Without having motivation, goals of learning is hard to be achieved because the students' effort and desire affect the learners in achieve the learning goals. By getting motivation students will be spirited in learning process, so they will be shoved to comprehend mathematics well.

The research conducted by implementing "guess math operations" game can improve students' motivation to learn mathematics and solving math problems. In practice, the teacher must supervise and provide simple and precise game instructions to make it easy for students to understand.

5. Acknowledgments

The authors would like to thank STKIP PGRI Situbondo the research financial support.

6. References

- Aprilianti, Yunis, Uning Lestari, and Catur Iswahyudi. "Aplikasi Mobile Game Edukasi Matematika Berbasis Android Application of Education Mobile Games for Math Based on Android." *Jurnal SCRIPT* 1, no. 1 (Januari 2013): 89-97.
- Arikunto, Suharsini. *Prosedur Penelitian: Suatu Pendekatan Praktik*. Jakarta: Rineka Cipta, 2010.

- Arsyad, Azhar. *Media Pembelajaran*. Jakarta: PT. Raja Grafindo Persada, 2011.
- Black, International. 2013. "UNDERGRADUATE STUDENTS' MOTIVATION Natela Doghonadze." (July): 4116-26.
- Hasanah, Ahirul. "Pembelajaran Berbasis Permainan TTS untuk Meningkatkan Prestasi Belajar Bahasa Arab Siswa MAN Godean Sleman Yogyakarta." Bachelor Thesis.
- Idris, Noraini. *Pedagogi dalam Pendidikan Matematik*. Kuala Lumpur: LOHPRINTSDN.BHD, 2005.
- Islamuddin, Haryu. *Psikologi Pendidikan*. Yogyakarta: Pustaka Pelajar, 2011.
- Permana, Putu Trisna Hady, I Gede Mahendra Darmawiguna and Made Windu Antara Kesiman. "JA-KO Balinese Pizza: Game Edukasi Interaktif Jaringan Komputer." *Jurnal Nasional Pendidikan Teknik Informatika (JANAPATI)* 3, no. 2 (Juli 2014): 80-87.
- Purmana, Neng Aprilia, Neng Sri Rahayu, and Rasi Yugafita. "Students' Motivation in Learning English." *Project (Professional Journal of English Education)* 2, no. 4 (Juli 2019): 539-544.
- Rusman. *Model-Model Pembelajaran Mengembangkan Profesionalisme Guru*. Jakarta: PT. Raja Grafindo Persada, 2012.
- Uno, Hamzah B. *Teori Motivasi & Pengukurannya Analisis di Bidang Pendidikan*. Jakarta: Buki Aksara, 2006.