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The Investment of Character Building of Elementary School Students Through Mathematical Learning with Experiential based on Game Strategy

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Abstract: Silberman (2014) stated that initial experience as a child makes the game is a way to learn. Playing is an important part of human development. Doing something while playing will be interesting if it presents a challenge. Games that are centered on active participants can be used as an innovative and fun element in the learning experience. This research aims to invest elementary students' character building through mathematics learning with experiential based game strategy. Meanwhile, character building is invested are religious, honest, tolerant, discipline, hard work, creative, independent, curiosity, reading pleasure, cooperation, and responsibility. This study is a part of a major research that has been partitioned into several titles and used development research method. The Thiagarajan, Semmel and Semmel development model introduced in 1974 is known as the 4-D model: defining, designing, developing, and disseminating. The research subject was MI Al Asy'ari grade 4 as a trial class and SD Islam Makarimul Akhlaq grade 4. We used qualitative research methods. This is used as a research procedure that produces descriptive data in the form of written words and observable behavior. The results showed that mathematics learning with game-based experiential strategy able to invest character building of elementary school students.

1 INTRODUCTION

One of the goals of national education as stated in Article I of the National Education System Law of 2003 is about the formation of characters that contain "develop the potential of learners to have intelligence, personality and noble character." (Salafudin, 2013). The importance of character building is expected to provide awareness to the educators in order to build the character of learners in every teaching and learning activity both at school and at the university as a means of behavior formation, enrichment of individual, values by being a role model for learners. Efforts to develop the character of the learner should be optimized by the teacher or lecturer by integrating character building in every learning process in class. Because it is the biggest mission of national education, it requires all educators to have a high concern for the attitude, character, and moral of the Indonesian. Based on the Indonesian dictionary, the word "character" is defined as the nature of the human mind that affects all thoughts and behaviors. It means

the character is related to moral strength, "positive" connotation and not being neutral. Thus, people are said to have character if he has a certain positive moral qualities.

Rasiman and Pramasdyahsari (2014) said that education builds character, implicitly implies to establish behavioral character and pattern that are based on or related to positive or good moral dimensions, not negative or bad. Chapman (2011) added that there were so much benefits and strengths of character so that if character building in school curriculum is properly implemented, it can make a different world which means positively affect the lives of all students involved.

Agboola and Tsai (2012) also showed that essentially the goal of character building is to model the characteristics of student's good character. Character building at the elementary level is one of the earliest cultivation and character formation of students because it is invested from an early age and the students are also in development time. Character building that is invested in learning mathematics in

this research is religious, honest, tolerant, discipline, hard work, creative, independent, curiosity, reading pleasure, cooperation, and responsibility.

To optimize character building in school curriculum especially on mathematics subject, there needs to be integration between character building and learning strategy in teaching and learning activity. Its abstract nature makes the subject of mathematics requires the right strategy to achieve the desired goal. Henriksen and Mehta (2016) have said that creativity is one of the most important and desirable qualities of thinking to succeed in the twenty-first century. Creative, inventive, and collaborative thinking is a necessary tool for the context of real-world mathematics. Appropriate learning strategy to the context of real world mathematics is experiential learning, a real-world learning strategy that will be used as one of the solutions in this research to build the character of students especially elementary students. Game learning is a main approach in experiential learning. Learning games centered on active participants which can be used as an innovative and fun element in the learning experience. This strategy is not used solely for wanting learners to rejoice during the process of teaching and learning, but as a means to achieve the goal (Silberman, 2014).

Based on the explanation above, the purpose of this research is to describe the character building's investment through mathematics learning with experiential learning strategy based on games for elementary students. We hope, educators always apply the character building in learning at the schools, considering the development in this era of globalization that many things happened in the world of education, especially in elementary school.

2 METHOD

2.1 Research Location and Subject

Design research is a series of plans that will be applied on the acquisition of information to be generated This research was conducted at the Faculty of Education, Mathematics Education Department, University of Hasyim Asy 'Ari. The campus location is located on Jl. Irian Jaya 55 Tebuireng Tromol Pos IX Jombang. In addition, this research also involves two other institutions namely MI Al Asy'ari Keras Jombang and SD Islam Makarimul Akhlaq Jombang. The population in this study were all fourth grade students. Sampling in this research was taken through random sampling technique (Sugiyono, 2010). The

implementation of random sampling technique is done by drawing.

2.2 Research Design

Design research is a series of plans that will be applied on the acquisition of information to be generated based on research activities undertaken. The design of this research can be described as follows:

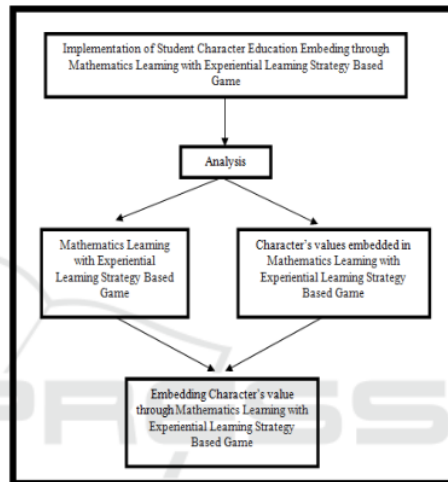


Figure 1: Research Design.

2.3 Data Collection and Data Analysis Techniques

This research used qualitative research methods. It is used as a research procedure that produces descriptive data in the form of written words and observable behavior. The data generated in this study is data in the form of words from the subjects and informants either in written or oral words. This research uses qualitative research methods because data obtained are data in the form of descriptive data that do not use data in the form of numbers to explain the results of research. The research method used in this research is adapted to the main objective of the research is to describe the character building through the learning of mathematics with experiential learning strategy based on the game of the students in elementary level.

Data analysis in this research is describing the investing of character building through the learning of mathematics with experiential learning strategy based on the game of elementary students. The steps

of data analysis are as follows: (1) Data reduction (Reduce data means summarize, sort things out, focus on things that are important, look for themes and patterns and remove unnecessary. (2) Display data (presents data in the form of matrices, Networks, charts or graphs, so the researcher can control the data and not drown with a stack of data) (3) Conclusion and verification (Initial conclusions are temporary and will change if no evidence is found strong support at the data collection stage) (Sugiyono, 2010).

2.4 Data Validity Test

In qualitative research, the level of validity is more emphasized on the data obtained. It means that the confidence on data research results can be said to have a significant influence on the success of a research. Data validity can be obtained by conducting credibility test to the data result in accordance with the test procedure of data credibility in qualitative research. There were many kinds of data validity test, such as the extension of observation, increased persistence in research, triangulation, discussion with peers, negative case analysis and member checks. In this study the researchers conducted an extension of the observer which is done to deepen what has been obtained. "Increasing time in the field certainly gives an opportunity for researchers to make details of his observations." (Sugiyono, 2010)

3 RESULT AND DISCUSSION

3.1 Mathematics Learning with Experiential Strategy based Game

Learning by experiential strategy is learning that begins by immersing learners in an experience and then encourages reflection on experiences to develop new skills, new attitudes, or new ways of thinking (Schwartz, 2012). Silberman (2014) added that experiential learning can be based on real work / life experience and structured experience that simulates or approaches real life experiences. Experiential learning uses a wide range of methodologies (Silberman, 2014), including: field experience, role playing, games, simulation, visualization, storytelling, adventure activities, etc. But in this study, researchers used experimental learning based on learning games.

Siberman (2014) revealed that game learning is a main approach in experiential learning. Early experiences as children make the game as a way to learn. Playing is an important part of human

development. A game based activity will be interesting if it provides opposition. Games centered on active participants, can be used as an innovative and fun element in the learning experience.

In this research, we use the story / problem solving in class. There are 5 materials used by the researcher to build the character of the students through experiential strategy based on game. Those are Currency, Least Common Multiple and Greatest Common Factor, Fraction Number, Integers, and circumference and area of triangle and parallelogram. The following will describe the learning activities of mathematics using experiential learning strategy based on each game material.

1. Material : Problem Story of Currency

Activities:

- Make an interesting game on this material, one of those is Role Play
- In Role Play, the teacher can prepare scenarios practiced in class
- The scenario could be about "Buy and Sell" by involving the background of the cooperative, canteen or in the class itself. With a note if in class, the teacher must prepare goods to be traded
- Involve students in the play with scenarios "Currency Story Problem"
- Another alternative if the teacher does not prepare the scenario is by asking the students to make their own setting and write their script

Materials Required: Some goods traded, Currency ranging from the smallest to the highest value, Script / Screenplay, and Paper (note of goods that will be bought)

2. Material : Problem Story Least Common Multiple and Greatest Common Factor

Least Common Multiple (LCM)

Activities:

- Make an interesting game, one of those is *Joyful Number Clap (JNC)*
- In *Joyful Number Clap (JNC)*, teacher asked students to clap their hand happily if a number is mentioned. However, It is not for all numbers
- The concept of *Joyful Number Clap (JNC)* is teacher ask student on a number mentioned. For example: teacher ask student to clap if the number she/he mentioned is the multiple of *two*, etc
- In this game, LCM concept can be inserted. For example: dividing the class into two groups. First group must clap if teacher

mention the number of *two* and it's multiple. While second group must clap if teacher mention the number of *three* and it's multiple. After doing clap, teacher let the student observe.

Materials required: marker or chalk, paper.

Greatest Common Factor

Activities:

- Make interesting games, one of those is *A Magic Bag*
- In *Magic Bag*, teacher asked one student to solve the problem. For example: problem is written in test book "*Latihan Dulu Yuk*" number 2
- The concept of Magic Bag is teacher prepares 36 candies and 24 chocolates. Teacher asked to one student
- The teacher's question is **how many students are given candy and chocolate to get as much?**
- Then, the one students before can think or ask friend to practice by share candy and chocolate in same portion
- The friend that help the student before can get a magic bag

Materials required: bag, goods used in the learning (candy, chocolate, etc)

3. Material : Problem Story of Integers

Activities:

- Make an interesting game like *Card Number*
- In *Card Number*, teacher makes card as same as the number of student, then deliver it to the students
- This *Card Number* consist of question and answer related with fraction number
- Student's job is to find the mate of the question and answer. It also can be called *Make a Match*
- After finding the mates, teacher checks together with the students and reflects again every question and answer in *Card Number*.

Materials required: Card Number, marker/ chalk

4. Material : Problem Story of Fraction Number

Activities:

- Make an interesting game like *Magic Circle*
- In *Magic Circle*, Teacher prepares many circles in big, medium, and small from cardboard
- The function of the circle is to introduce student about the concept of integers together with the illustration of problem story solving

- First, teacher introduce integers concept as division of an object. The object used is *circle magic*. For example, $\frac{1}{2}$ is obtained by cutting 1 circle into 2 equal parts. Do the same thing with the integers, like $\frac{1}{3}$, $\frac{1}{4}$, and $\frac{1}{6}$. After that, ask the students to compare the piece of circle $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{6}$, etc.

- Then, teacher asks student to imagine that the circle is a cake. Let the student to solve the teacher's problem when he/she want to divide the cake. The example question is **I have a circle cake. $\frac{1}{2}$ of cake, I gave to Ani, $\frac{1}{4}$ of cake I gave to Rina, how much is the rest of my cake?**

- Beside using *Circle Magic*, other alternative media that we used is *string or ribbon*.

Materials required: cardboard that has been cut into *Circle Magic*, marker/ chalks, and string or ribbon (for the next game, optional)

5. Material: problem story of circumference and area of triangle and parallelogram

Activities:

- Make an interesting game like *D & C (Draw & Count)*
- In *D & C*, divide the class into two groups, then teacher asks student to sit in circle (the class can be indoor or outdoor).
- By using the floor/ground floor, teacher draws triangle/parallelogram with chalks/marker and gives the size of its side (the size must be from the smallest first).
- First, the size of the side can be the size of student's foot. Then, teacher can begin to give size on each side ranging from small to large.
- This concept of *D & C*, teacher asks one students to come forward to measure the circumference by going around of the side.
- Before coming forward, students have given small paper to discuss the answer with their friends.
- If the measurement is wrong, that student must go inside of the triangle until his/her friend help them outside by measuring in the right way. Meanwhile if the measurement is right, the group will get star as the reward.
- Do the same with the area, teacher prepares small paper to students to discuss the area.
- Students discuss the answer together with the group.

Materials required: marker/ chalks, small pieces of paper, eraser, wet tissue (to wipe marker line in the floor).

3.2 Character Building Invested in Mathematics Learning with Experiential Strategy based Game

In this study, the investment of character building focuses on 11 character values. Those are religious, honest, tolerant, disciplined, hard work, creative, independent, curiosity, happy reading, cooperation, and responsibility. According to the Directorate General of Secondary Education (2011: 34), the character building can be described as table 1.

3.3 Analysis on Investing Elementary Student's Character Building through Math Learning with Experiential Strategy based Game

In general, the investment of character building in mathematics learning using game-based experiential strategy is done optimally. In each teaching-learning activity indirectly, educators always insert the values of character.

The values of character in mathematics learning using game-based experiential strategy are as follows:

1. Religious

Faith is the value of character in relation to God the Almighty. In other words, human's thoughts, words, and actions must always based on the values of the God or religious teachings. Practically, before the learning and teaching activities begin, the teacher asks students to start and end the learning by praying (figure 2).

2. Honesty and Independence

Basically honesty and independence is not only owned in the area of cognition but also practiced in real life. It is shown from the practice when students are asked to do their own assignment. Most students do on their own, with their abilities and beliefs without depending on others. Even so, there are still students who look for opportunities. But when they are reminded by the teacher, the student immediately discouraged (figure 3).

3. Tolerant

The attitude of tolerance that appears in the teaching and learning activities is when the students give an opinion about the results of his work and the other students listen and appreciate his opinion if it is not appropriate. If there were differences of opinion, the student will speak it after the other students finished in convey his opinion without any element of hate / kind.

Table 1: Character Building Description.

No.	Value	Description
1.	Religious	Attitudes and behavior are obedient in implementing religious teachings
2.	Honest	Behavior based on an attempt to make himself or herself trustworthy in words, actions, and work
3.	Tolerant	Attitudes and actions that respect different religious, ethnic, opinion other people's differentiation
4.	Discipline	Measures that demonstrate orderly behavior and abide by various rules and regulations
5.	Hard Work	Behavior that shows a genuine effort to overcome the obstacles of learning and duty, and complete the tasks as well as possible
6.	Creative	Think and do something to generate new ways or results from something you already have
7.	Independent	Attitudes and behaviors that are not easy depend on others in completing tasks
8.	Curiosity	Attitudes and actions that always strive to know more deeply and extensively from what they learn, see, and hear
9.	Happy Reading	The habit of taking the time to read the various that give good to him
10.	Cooperation	Attitudes and actions that can demonstrate team cohesiveness, such as teams in study groups, helping each other and complementing each other
11.	Responsible	Attitudes and behavior of a person to carry out his duties and obligations, which he should do to himself, society, environment (Nature, social, and culture), and the state of God Almighty.



Figure 2: Praying together.



Figure 3: Do the assignment in the test book.

4. **Discipline**
Discipline is well implemented. It is seen in the teaching and learning activities. There are no students that are late to come, the homework was completed properly.
5. **Hard Work**
Hard work in this case is seen from the earnest spirit to follow the learning and do the task with full responsibility. They are aware of her obligations as a student.
6. **Creative**
This is seen from the some student answers that use new methods that fit the concept with the material being taught (figure 4).

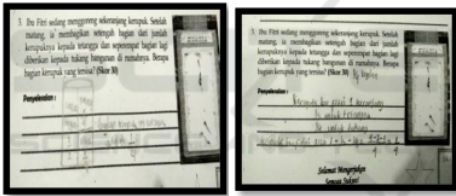


Figure 4: Student's Answer in Integers Question.

7. **Curiosity**
The curiosity of each student is seen at when the teacher gives the opportunity to ask, the student's active role is very visible. Most of the students ask bravely without shame
8. **Happy Reading**
Pleased to read is seen at the meeting of learning. Students have been able to follow the learning well, because the teacher has requested that students to equip themselves with learning the day before. They might read either in the existing or personal print books, student worksheets that have been obtained or looking for information and other references in the library and others
9. **Cooperation**
In teaching and learning activities, teachers are often to divide the students into several groups. At the time of the grouping, the cooperation of each

group is visible while completing a given game or worksheet. They are seen sharing ideas, exchanging ideas, helping each other, and equipping them (figure 5).



Figure 5: Cooperation in the group.

10. **Responsibility**
It is seen as the attitudes and behaviors of students when doing the assignment given by the teacher. The students do the assignment according to the instructions given by the teacher. All are completed properly: both of individual and group assignments, both home and school assignments (figure 6).



Figure 6: Students are doing the assignment given by the teacher.

4 CONCLUSIONS

Based on the research results, it can be concluded that the investing of character building values in the learning of mathematics with experiential strategy based on games in the academic year 2017 - 2018 is generally done optimally. Each teaching and learning is always inserted the character values, with the support of math learning devices that use game-based experiential strategy. The process of investing is then applied through understanding, habituation, and good role models, started from the teacher and delivered to the students, adapted to the material and student condition.

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