Development of Communicative Character through Mathematics Learning
A Monopoly Game Based

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Abstract: This study aimed to apply Indonesian monopoly game which could develop communicative character in mathematics learning. The method descriptive was used with the subject of 40 students of grade IV elementary school. The results showed that the development of communicative character listening attentively occured at the stage of reading questions, determining answers, presenting answers, teacher explanations, and reading information's. The character expressing opinions was developing at the stage of determining answers and presenting answers. The development of a character communicating to provide information took place at the stage of reading questions and information in the certificate. The factor that encouraged willingness growth in listening attentively was an element of competition in the game, while the encouragement in expressing an opinion was a fun and non-stressful learning environment. The character communicating well was due to curiosity. A good learning process through the game was not just as entertainment, but also developing aspects of cognitive, psychomotor, and even affective. Through a game, students learned mathematics in good shape. This eliminated fear, raised curiosity, and affected the development of communicative characters.

1 INTRODUCTION

Character development as the focus of education in elementary school is the Indonesian government policy. Communicative is one of the characters that needs to be developed so that students will be able to live and overcome the problems in the global era (Keane, Keane, and Blicblau, 2013). The communicative characters include: (1) articulating ideas or opinions effectively, (2) listening effectively, (3) using communication for various purposes, (4) using media and technology, and (5) using communication effectively in various environments (Pasific Policy Research Center, 2010). The development of communicative characters can be integrated into learning. However, communicative characters are difficult to develop in mathematics learning. Many students just listen even sometimes do not pay attention to teacher explanation. Only certain students dare to write answers on the board, but have not dared to explain their work. Therefore, innovation is needed in learning mathematics, which is using game to discuss problem or exercise, so that communicative character can be developed.

Previous research has shown that game-based learning can improve learning achievement (Ke, 2008; Ke and Grabowski, 2007; Kebritchi, Hirumi, and Bai, 2010; Owston, Wideman, Ronda, and Brown, 2009; Papastergiou, 2009; Suh, Kim, and Kim, 2010), especially for students with low ability (low achievers) (Ku et al., 2014). Game-based learning also improves learning motivation (Dickey, 2011; Kebritchi et al., 2010; Papastergiou, 2009; Park, 2012) and shapes a positive attitude (Ke, 2008). In addition, the game helps students learn naturally (Li and Tsai, 2013) and can be used to link the materials with everyday problems, so students will understand the benefits of learning math and are able to use it to solve problems around it (Ucus, 2015).

So far, there are no research findings that discuss the role of game-based learning to develop communicative characters, especially in learning mathematics. Therefore, this study aims to apply the Indonesian monopoly game which can develop communicative characters. The results of this study are expected to be useful for developing game steps

that can be integrated in learning in order to develop communicative characters.

2 METHODS

This research method was descriptive qualitative. The research subjects were 40 fourth graders of elementary school who had been accustomed to follow conventional mathematics learning, which was listening to teacher explanation then solve mathematical problems contained in worksheets or books. Subjects had also never followed game-based learning. However, the subject had known and played a monopoly. In this study, monopoly game based-math learning was done as much as six times to know the consistency of the communicative characters' emergence. Data were collected by means of direct observation techniques, indirect observation, and interviews. Direct observation was done towards monopoly game based-math learning process by using instruments in the form of observation sheet and field note. To observe the learning process, indirect observation through the learning process video that had been done was conducted. Semi-structured interviews aimed at exploring information regarding the communicative character driving factors. Interviews were imposed on two different subject groups. The first group of interview subject were passive students on conventional learning but dared to express an opinion on a monopoly game based-learning. Interview on this subject was intended to obtain information about the factors driving the emergence of courage to express opinions. The subjects of the second interview were students who were less concerned about conventional learning activities but were willing to hear or pay attention to teacher or friend explanations on monopoly-based learning. Interviews on this subject aims to explore information about the causes of willingness to listen or hear opinions of friends or teachers. Data analysis was done by steps: (a) describing the result of observation towards the appeared communicative characters, (b) making transcript of interview result about the students' reasons in performing communicative characters, and (c) linking observations with the interview results.

3 RESULTS AND DISCUSSION

Monopoly game-based learning was designed with stages that gave rise to the development of communicative characters. Monopoly game-math based learning was conducted on the school yard (outside the classroom) with the steps described in Figure 1.
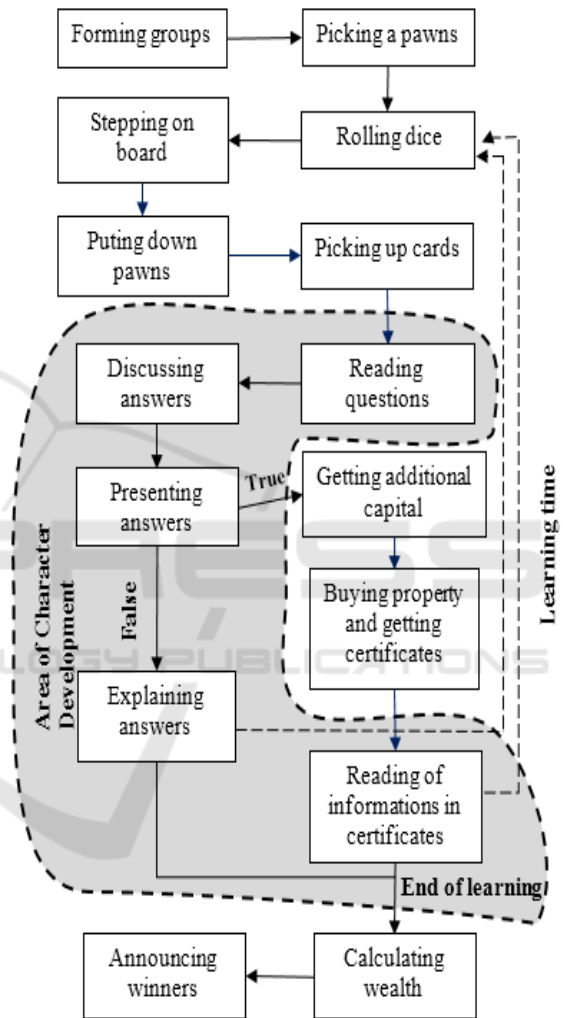

Figure 1: Stages of monopoly games.

Based on Figure 1, it could be explained that the development of communicative characters were found in the shaded area, i.e. the activity (a) reading the questions, (b) discussing the answers, (c) presenting the answers, (d) reading the information on the certificate, and (e) explaining or consolidating answers. Mathematics learning activities started from the presentation of mathematical problems or questions in the card. The material was read by the

players (group representatives). After that, all the groups discussed to determine the answer to that question. Next, the player presented the group's answers. If the answer was correct, then the player would get additional capital and was eligible to buy the property. The players read the information contained on the property's (ownership) certificate. However, if the player's response was wrong, then another group would be eligible to answer the questions. If all groups could not answer the question, the teacher explained how to find the correct answer. The communicative characters that developed at each stage of the monopoly game are presented in figure 2.
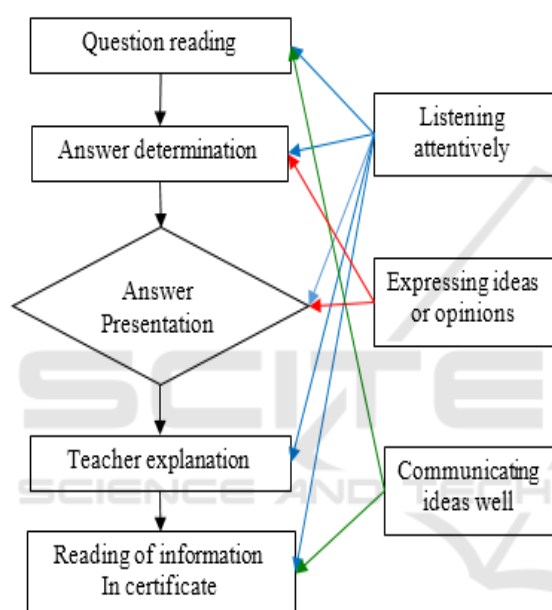

Figure 2: The communicative character of monopoly game based learning.

Figure 2 shows that in reading questions the player must communicate the questions well so that all students could understand the question. The teacher would ask the player to repeat the questions if the other students had not understood the purpose of the questions. In this way, students learned to communicate through reading activities for the purpose of informing them. When a player was reading a question the whole students tried to listen to questions attentively. All students wanted to know the question to be discussed so that each group could participate in finding the answers. In this case, the presentation of questions through the game posed challenges to students (Frossard, Barajas, and Trifonova, 2012; Ke, 2008), thereby increasing student activity or involvement in learning, for

instance: expressing opinions and listening to friends or teachers' explanations.

After reading the question, students tried to find answers through group discussions. Each member of the group dared to express an opinion. As long as there was a group member who expressed an opinion, the other members would listened attentively. Group members were very concerned about their friend's opinion, then considered earnestly to get the right answer. Each group hoped to find the most appropriate answer, so that they would be able to get additional capital and buy property. At this stage there was a development of listening character with great attention and expressed opinions well. Providing additional capital and property buying rights was a unique form of reward and did not occur in conventional learning. The reward was adjusted to the rules of monopoly game. Thus, the game provided uniqueness both in the learning process and in the provision of reinforcement. The thing was that it raised the motivation to participate or engage actively in game based learning (Ke, 2008; Ucus, 2015).

Furthermore, players dared to express opinions or answers that had been agreed by the group, while the other students listened to the player's answers with a great care. Bravery was due to the emergence of student self-confidence in mathematical performance. Students believed that the answers conveyed were the result of shared thinking with group members. In a nut shell, game-based learning can be used to increase confidence in mathematics (Ku et al., 2014). A playful, relaxed, and not-stressful atmosphere of play also encourages students to be more courageous in expressing their opinions (Ke, 2008).

When a player presented an answer, all students listened attentively. There were two reasons why students paid attention to the player's answer. First, students wanted to match the answers they had. Secondly, each group wanted to know the player's answer and hoped that the player's response was wrong, so they had an opportunity to answer questions and get additional capital. Each group tried hard to get additional capital to win the game. The needs of knowing the correct answers (the material learned) and the desire to win a game or an element of competition encouraged students to listen attentively. This suggested that the game raised the motivation to compete and indirectly increased involvement in learning (Park, 2012).

Players who answered correctly would get additional capital and were able to purchase property in the form of land, house or hotel. Property

ownership proof was certified. The property owner read the information contained in the certificate. In this case, property owners learned to communicate for the purpose of telling. Other students listened to the reading of information attentively because the information was very interesting and was a new knowledge for students. Very interesting information arouse curiosity, so students would be willing to listen attentively. Curiosity encouraged increased interest and motivation to follow learning (Ucus, 2015).

Furthermore, if all groups were failed to answer the question, the teacher explained or gave instructions on how to get the correct answer. Teachers did not answer directly. This triggered the students to listen to the teacher's explanation in order to find out the correct answer. The role of teachers in game-based learning was different from conventional learning. Teachers acted as a mentor and also facilitator and helped students to reflect on what was being learned (Park, 2012).

4 CONCLUSIONS

Monopoly-based math learning is conducted for review sessions or training students to solve problems related to the material being studied. By and large, the use of monopoly games creates a pleasant learning situation, eliminating fear and boredom and generating interest in the learning process. Competition elements in the game also build the spirit of learning, thus motivating students to engage in learning, for example: listening, express opinions, and communicate well.

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