THE USE OF MONOPOLY-LIKE GAME (MLG) TO PROMOTE QUALIFIED SCORES FOR THREE STUDENT COMPETENCIES

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ABSTRACT

Learning ideally accommodate to not only improve cognitive competencies but also social and psychomotor as well. In fact, many practices are still lack of aforementioned concern, learning about thermal energy and its flow for instance. It focuses mainly on cognitive scores which indicate whether students can pass the exam or not. Hence, this research aimed at describing the use of MLG to promote qualified scores for competencies students have to achieve based on curriculum 2013, namely, social attitude, psychomotor and cognitive competencies altogether. In doing so, one shoot case study design was employed and involved 15 students of grade 7th. The research results showed that the students gained scores for those competencies. Each of which was 3.50 – 3.85, 3.60 – 4.00, and 3.60 – 3.80 respectively. As such, it indicated that the game was successfully promoting qualifying scores for student competencies.

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INTRODUCTION

Curriculum 2013 has mandated that science learning must develop knowledge and positive behaviors at the same time. The indicators for those encompass three different competencies, namely, attitude, cognitive, and psychomotor. Attitude brings about internalized characters built step by step throughout the learning process. Honesty, creativity, and feeling to be capable of are the example that can evolve using contextualized activities in the classroom (Khusniati, 2012). Machin (2014) found that having a discussion and addressing ideas will influence student attitude such as valuing other students' opinion so as to increase the social relationship. In such a case, students can have more social access among them. Different from attitude, knowledge is about to make students understand the concepts of learning material. Richardson, Abraham, and Bond as cited in Broadbent & Poon (2015) contended that competency of knowledge is always explained in traditional view as how much score students can achieve after examination, especially when the teachers use paper-pencil test or oral test. The scores are then matched to the standard of curriculum 2013 to judge whether the students can pass or not. The third competency, psychomotor, is portrayed as the collaboration between what students think and what they do; or in other words, it stands for hands-on activities, including the way they operate laboratory apparatus (Brinson, 2015) as

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part of scientific method.

In fact, the mandatory to accomplish high results in three competencies encounters serious challenges when it comes to science learning. The pilot study involving 20 students in public junior high school 32 Surabaya unveiled the support to the concern. More than 65% of them asserted that learning science was categorized as difficult because they possessed a low score in their examination. This problem was assumed to link to the didactic teaching model which was implemented in the classroom. In such a case, a teacher will have a privilege to officially control students' learning behavior so as to increase student understanding towards the vast amount of material (Wang, 2011). This occurred in learning about thermal energy and its flow. In light of research, students who suffer from such a teaching model show passive attitude and their score is about no more than 64 which means below the standard, 75 (Kulsum & Hindarto, 2011). Besides, student understanding of thermal energy is limited to the high temperature and is difficult to reach an understanding of its implication in real life setting. In terms of psychomotor competencies, didactic teaching can lower student experience active collaboration between minds-on and hands-on activities when they just receive all the information from the teacher.

Many ways have been introduced to tackle the aforementioned problems ranging from collaborative learning to inquiry learning. Those have the same point, that is, the learning process must induce the students to show their active participation to construct their understanding by which entail the theory of personal and social constructivism (McInerney & McInerney 2010). This research, however, focuses mainly on bringing the value of the traditional man-made education game (MLG). This is because of two reasons. First, as far as the research about traditional education game, especially cards game, going further, it is known that most of the research is limited to only observe no more than two student competencies (Sung et al., 2013; Charlton, et al., 2005; Machin, 2012). Hence, this research stands for the support of the research that has been in a scope of three competencies.

Second, traditional game benefits to student learning. Rohwati (2012) showed that traditional game can trigger the appearance of a positive attitude and behavior such as, giving criticism and appreciating opinion during the teacher-student discussion. Likewise, Mutiah as cited in Nur (2013) explained that science education game can guide students to increase their sensitivity towards social issue whereby they can adjust their behavior within a particular situation. Hence, this article describes the use of MLG to student learning in terms of three student competencies.

METHODS

To investigate the extent to which MLG benefits student learning, this research used one-shot case study research design (Fraenkel et al., 2012) with MLG itself as the independent variable, whereas the students' competencies as the dependent variable. The design employed 15 students who were then divided into three heterogeneous groups. The heterogeneity of each group was basically determined by cognitive and psychomotor competencies whereby the leader of the group was the student who outperformed the others. The data were collected using two instruments. First, rubrics were employed to observe attitude and psychomotor competencies the students performed during the learning process. Second, paper and pencil test was used to record cognitive competencies after the learning process. Rubric for attitude contains three items, that is, spiritual attitude, honesty, and responsibility. The scale ranged from 4 to 1. Likewise, rubrics for psychomotor consist of 4 scale points, but the items are only two, namely, skill to generate hypothesis and make a conclusion from the data given. The data were then analyzed using descriptive manner to result in a comprehensive description about the use of MLG.

RESULTS AND DISCUSSION

The Students Played the MLG

The MLG is made based on a traditional monopoly game consists of a board game, dices, pawns and cards (question-answer cards, information cards, punishment cards, and scoreboard). The board game displays 35 boxes in which each function to support student learning academic and attitude aspects such as answering questions, evaluating answers, and making social commitments.
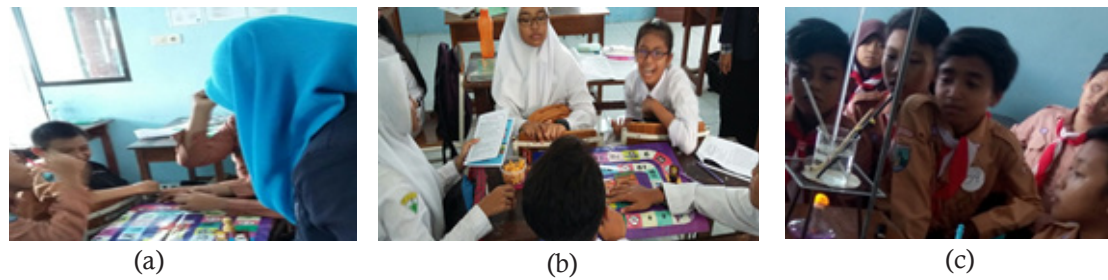
Figure 1. Process of Student Playing MLG; (a) Teacher Gave Instruction for Playing MLG; (b) Student Played the MLG and Showed Social Interaction; and (c) Student Did Experiments as Instructed in the Card of MLG to Deal with Psychomotor Competencies.

Before playing the game, the students were split into several groups of five. In each group playing, then each student did rock-paper-scissors to determine who would be in the first place to play the MLG. The MLG began when the first student rolled the dices to show how many dots to determine his steps on the board game, starting from the 'start' box to 'finish' box. When the pawn stopped to a particular box, the student-player would take the card in accordance with the box-printed instruction. If the student-player was unable to accomplish the task on the card, he could offer the task to the others. Punishment cards then were applied to those who were not capable of doing the task. For those who successfully accomplished the task, scores were rewarded. The winner was determined by the 'finish' box.

The Results of the Game in Supporting Three Competencies

The assessed learning competencies are attitude, psychomotor, and cognitive aspect. Each of which has different substances. To obtain a clear picture, each of the research results on these is described clearly in the following subsections.

Attitude Competencies

The purpose of attitude assessment in this research was to know the spiritual attitude in accordance with the Core Competency I and the social attitude of students related to the Second Core Competence during the learning of thermal energy and its flow using the MLG. The spiritual attitude recorded in the instrument was grateful for the greatness of God who has created thermal energy that can play a role in maintaining the balance of life system. The social attitudes assessed were the honesty and responsibility during the use of MLG and thermal energy transfer. The honesty related to their honesty during the game and in answering the problem. The social attitude of responsibility included the responsibility in performing the game and the responsibility in utilizing the tool/board game. The following data present the results of the observation.
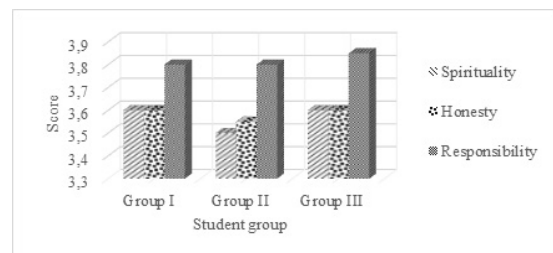

Figure 2. The Average Score Comparison of Spirituality, Honesty, And Responsibility Among Group Of Students

The diagram above shows that all groups had almost the same value in the sphere of spiritual, honest, and responsible attitude; the difference was about 0.5 to 1. In such a case, all students were categorized to be 100% completed in the spiritual aspect because all groups had succeeded in obtaining values ranging from 3.50 to 4.00. The spiritual attitude arose when the students got information about how great the God creates thermal energy and its implication in daily lives. For instance, the flow of the gas particles (wind) from the sea to the land is one of the events caused by thermal energy. Before the industrial era, all the fishermen used the wind to go home after fishing. Even today, energy from the wind is still utilized to balance the expenditure on the use of petrol. Similar to the spiritual aspect, students are also categorized as 100% complete in the honesty and responsibility aspects. The range of scores they obtained was 3.50 - 3.60 and 3.80 - 3.85 respectively. These two attitudes arose from the way the students

play MLG. The students were required to play honestly and be responsible if they got a penalty and had to accomplish the assigned duties. According to Cojuharenco et al. (2016), the emergence of a responsible attitude is triggered by the commitment or interconnection among students. In other words, all students acted as supervisors and each of them was convinced not to violate any prescribed rules or conditions. As such, until the game ended, all students could be responsible for the results they wanted to achieve.

When looking at the honesty, this attitude cannot be separated from the responsibility. Precisely, the commitment was maintained because each student kept acting honestly until the game was over. A sense of honesty ould foster mutual trust so that the aim of the game was not only to win the game but also to understand the science concepts on the thermal energy and its flow. The growth of this good character is in line with the research conducted by Mulyatiningsih (2011) which asserts that games involving specific roles, such as those depicted in MLG, could foster good character in students. The specific role was that each player was accountable to himself as someone who acted to run the game as required by the rules of the game. Such an indication is shown by the figure (1.b) that the MLG provided chances to do social interaction to build good character by which the students could give social feedback to each other to support honesty and responsibility.

Psychomotor Competencies

According to Vygotsky's theory, the students could develop their psychomotor competencies if they directly interacted with one another (McInerney & McInerney 2010). Using the MLG, a group of students gave chances to its member to share information either game rules or knowledge aspect so as to enhance both social aspect and scientific skills at the same time.

The assessment of psychomotor competencies lays on the Core Competence IV National Curriculum. The psychomotor competencies in this research are limited to the skill of generating a hypothesis and conclusion based on the data of the various component effects in heat transfer. The assessment was conducted by giving the test of skills after learning process using the MLG. The result is presented in the table below.

Table 1. The Average Score of Psychomotor Competencies Among Groups of Students

Groups	Competency I	Competency II
Group I	3,6	3,8
Group II	3,8	3,8
Group III	3,6	4

The students' psychomotor competencies after playing MLG were categorized as good to pass from the curriculum standard, the scores were in the range of 3,50 - 4,00. The group 3 possessed the highest score because they were able to generate a hypothesis and conclusion in the very good criteria. The hypothesis contained the experiment variables as shown in (figure 1.c) and the conclusion extracting the essence of the data. In terms of MLG, Wasilah (2012) asserted that card game could guide students to make a better conclusion as long as the game requires students to write about the experiment concisely. This is due to the students' ability in matching the data presented in the card.

Looking at the picture below, the students enjoyed the experiment during the MLG game. They were enthusiastic to observe the data as shown in figure (1.c) which meant they followed the experimental procedure to test the hypothesis and record the data for drawing up the conclusion.

Cognitive Competencies

Cognitive competency is regarded as the ability to understand the material. The assessment is done by a paper-pencil test given. The questions are arranged based on the cognitive levels in Bloom Taxonomy from understanding level to evaluation level. Those include ten questions of multiple choice type and five essays. The result is about in the following table.

Table 2. The Average Score of Cognitive Competency among Groups of Students

Groups	Average score
Group I	3,6
Group II	3,8
Group III	3,6

Related to table 3, the students' cognitive scores on thermal energy and its flow after using MLG were in the range 2,96-3,40 and already passed the standard. The number of students achieving the standard score increased dramatically from last year which was only 65%, according to the interview with the teacher. This is in line with the research conducted by Priatmoko & Diniy (2012) that learning outcomes improve over the use of the media. The MLG provides reinforcement on the knowledge aspect by means of every end of learning, the students' knowledge competence was strengthened using the questions contained in the card. Therefore, the students' knowledge of the taught material was getting stronger and stored in long-term memory. This is consistent with Levie & Lentz (1982) statements as cited in Arsyad (2014) learning media could facilitate the purpose for understanding and remembering information.
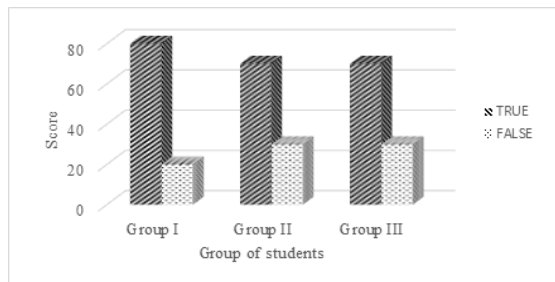

Figure 3. The Percentage of Student Answer of Multiple-Choice

The percentage of the true answer for the three groups ranged from 60 to 80%. It indicated that all groups could master the topic. The seemingly difficult questions for the students were the item 4 and 6. This was because the item 4 questioned about the temperature of the mixed components of an object and the students did not understand the calculation. Comparing to the item 4, item 6 gave a different style of question. It asked about a natural phenomenon related to thermal energy. However, the students encountered difficulties due to the biased options. Such a shortcoming seemed to happen as the students were lack of information about the questions due to time-consuming.

Although the research results have shown good indicators, two obstacles remained there. First, at the beginning of the game, the students tended to have difficulties to follow the game rules, thus, it affected the main taught materials. Second, the MLG combining learning and playing, employed a vast amount of time rather than the time being used by the usual approach to learning. Therefore, the teacher as a learning facilitator must be able to take into account the use of this game on certain materials and the allocation of time.

CONCLUSION

The MLG played to support the students in learning the topic of thermal energy and its flow was capable to promote three competencies based on the standard of Curriculum 2013; attitude, psychomotor, and cognitive competency. There were two benefits of using the game. Firstly, the information presented on the card could promote the students to realize and recognize what the essential is. By doing so, they could manage their knowledge to understand the concepts. In addition, the students also used their skills of the scientific method to generate hypothesis and conclusion. In other words, this would affect both cognitive and psychomotor aspects at the same time. Second, the rules of the MLG set by the students could make them be honest and responsible for their role. This influenced the attitude of the students.

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