Developing 21st Century Skills for Elementary School Students Grade 1 by Implementing Indonesian Traditional Games in Mathematics Learning

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Abstract—Nowadays, people are required to have 21st-century skills. The development of these skills can be carried out in all disciplines. One of them is mathematics learning. These skills can be cultivated through various traditional games in Indonesia. This study is a descriptive study to analyze 21st-century skills for grade 1 elementary school students by implementing traditional games. The analysis included critical thinking, creative, collaborative, and communicative skills, which can be developed as an implementation of traditional games on mathematical learning. The data was collected by observing students and interviewing teachers during the implementation of traditional games. The results were 21st-century skills can be developed by implementing the traditional games with mathematics concepts.

Keywords: 21st century skills, Mathematics learning, traditional games

I. INTRODUCTION

In the 21st century, competition in various fields is very strict, especially in the education area. Change is the only constant [1]. We are faced with the need for qualified and competent human resources. Quality human resources, which are produced by quality education, can be the main force to overcome the problems experienced. One way to improve is by improving the quality of education [1]. Implementing 21st Century skills in a class means teachers should provide students through carefully planned lessons and assignments, with opportunities to cultivate 21st-century skills within every subject. These 21st-century skills are more important to students now than ever before.

The 21st-century skill is called four C. The four C’s of 21st Century skills are some of the most popular learning strategies in today’s environment. The four C’s are: (1) critical thinking, which is all about solving problems, (2) creativity, which is all about students think outside the box, (3) collaboration, it shows students how to work together to achieve a common goal, (4) communication lets students learn how to best convey their ideas [2]. On a larger scale, these four qualities are essential for modern students to succeed in school and the workplace.

To accommodate 21st-century skills, teachers must be creative in designing learning to support the development of 21st-century skills. One of learning approach that can support 21st-century learning is game-based learning. Game-based learning is a new cultural contextual form that stimulates patterning, organizing information, and developing relationships, therefore, promoting problem-solving and critical thinking abilities within a socially constructed environment [3]. The students should have enjoyable when studied in every subject, including a difficult lesson.

Mathematics is one of the subjects that students faced difficulties, but it can be accommodated by conducting game-based learning. The teacher can design game-based learning by combining traditional games in learning. As research was conducted by Lestariningrum [4], the traditional games gave a better effect on Mathematical Logic Intelligence. It is one of the aspects of critical thinking skills. The other research was conducted by Nazrullah [5], it showed that traditional games could be a true example to show number used to support the rule of games in daily life in Indonesia. Not only critical thinking, traditional games also develop social interaction. The form of social interaction of students in traditional games in learning mathematics is that students can become peer tutors of every game played along with mathematical concepts [6]. Also, Nugraha et al. [7] proof that there is the influence of traditional game-based learning to the students’ social skills.

Actually, there are many kinds of traditional games in Indonesia. The traditional game still can be used as the learning activities of modern students [8]. The teacher can conduct it in mathematical learning to improve 21st-century skills for students. This study aims to analyze and describe century skills for grade 1 elementary school students by implementing traditional games in SDN Kintelan 1, Yogyakarta. The traditional games which were conducted are “Telur Penyok,” “Koba Tiup,” “Dakon,” and “Sret-sretan”.

Dewi & Aprinastuti [9] developed a traditional game manual for teachers in learning mathematics. From the development of the book, researchers then looked at the possibility of developing 21st-century skills during the trial implementation of the traditional game.

II. METHOD

A. Setting

The method of this research is a descriptive study. This study aims to describe and analyze 21st-century skills on the implementation of traditional games and mathematics learning for elementary student grade 1. The research subjects are 30 students and 5 primary teachers in Yogyakarta.
B. Data Collection

The data were collected by (1) observing, which was observed during the implementation of traditional games, (2) the questionnaire, which was distributed to teachers, (3) interviewing which was conducted in an informal setting, (4) documenting, which was during implemented traditional games.

C. Data Analysis

Data that has been gathered then analyzed using descriptive qualitative [10]. The analysis step of descriptive model data was (1) data description, (2) data reduction, (3) checking data validity, (4) data analysis, and interpretation based on substantive theory.

III. RESULTS AND DISCUSSION

The results of this study about developing 21st-century skill are bellow (1) critical thinking, which is all about solving problems, (2) creativity, which is all about students think outside the box, (3) collaboration, it shows students how to work together to achieve a common goal, (4) communication lets students learn how to best convey their ideas

A. Developing 21st Century Skill by Implementing “Telor Penyok” game

![Telor Penyok Game](image1)

![Table I: Developing 21st Century Skill by Implementing “Telor Penyok” game](table1)

| Procedure | Category 21st Century Skill | Developing 21st Century Skill |
|-----------|-----------------------------|------------------------------|
| Students are divided into groups of 3-8 students | Creativity | Students should make a strategy and think outside the box how to determine the egg |
| The stake is plunged around “the parent” with a strategy to determine the exact location and amount so that the egg is not taken | Creativity | Students should make a strategy and think outside the box how to determine the egg |
| students who do not become “parents” set a strategy so that the eggs can be taken at most from the others | Creativity | Students should make a strategy and think outside the box how to take the egg |
| students take eggs and count the numbers | Critical thinking | The student should solve the problem given |
| when students succeed in taking it then write down on paper and communicate the results accompanied by reasons | Communication and Collaboration | The student should make collaboration with others and communicate the result and reason |

B. Developing 21st Century Skill by Implementing “Koba Tiup” game

![“Koba Tiup” Game](image2)

![Table II: Developing 21st Century Skill by Implementing “Koba Tiup” game](table2)

| Procedure | Category 21st Century Skill | Developing 21st Century Skill |
|-----------|-----------------------------|------------------------------|
| The game is done in pairs using rubber which is played by applying distributive properties | Creativity | The student should make a strategy to make the starting line so that they can solve the place value of the numbers |
| students make a starting line horizontally, two sticks are stuck with a distance of more than 2 meters as a place of tens and units | Critical thinking | When the teacher gives a signal, the student should think about how to solve the problem within the best solution |
| the teacher gives a signal by saying numbers then student think how to solve | Collaboration | The student should make collaboration with others so they can get the right answer |
| students throw the rubber from the start line according to the color on the stick place value | | |
| students communicate the results of numbers | Communication | The student should present the answer |

C. Developing 21st Century Skill by Implementing “Dakon” game

![Dakon game](image3)
Critical and inventive thinking is one of the Emerging 21st Century Skills (Kaur & Toh, 2016). The development of critical thinking skills is seen in each of these games. The four traditional games require students to be able to solve the given problem. In another word, the traditional game above can be used as a medium to develop students' critical thinking skills. This is supported by the results of interviews with teachers stating that traditional games can be used to develop the ability to solve problems. Therefore, according to Kaur & Toh [1], which states that having critical thinking skills means having the ability to solve problems. Creative thinking skills are seen during the game process. Students must develop strategies in order to solve problems. Collaborative skills are seen when students work together with their partners to get the right answers. Communication skills are seen in every game because students present and submit answers verbally and in writing.

IV. CONCLUSION AND SUGGESTION

According to results and discussion, the conclusion of this study is 21st-century skills can be developed by implementing traditional games with mathematics concepts. The researcher recommends that the next research should make descriptive of the other traditional games.

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