Using of Jarimatika counting method (JCM) to slow learner students in a mathematics lesson

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Abstract. The purpose of this research is to explore the use of Jarimatika counting method (JCM) in a mathematics lesson. The research method used is a case study involving five (5) slow learner students and one mathematics teacher. Data were collected using interviews, observations, field notes and written test results. Data analysis using qualitative analysis data model consisting of 3 stages, namely (1) thematic analysis of all participant (2) within-participant thematic analysis (3) cross-participant analysis. The results showed that the counting learning outcome, as many as four students had exceeded the score of mastery learning, while 1 student has not exceeded the mastery learning score. The conclusion of the research can be stated that JCM can improve student learning outcomes, slow learner. Improved learning outcomes due to the enthusiasm of teachers and students, curiosity and easy understanding of the use of JCM in counting learning.

1. Introduction

Students with special needs are students whose learning requires special attention by the teacher. Each student with special needs with characteristics, weaknesses, and strengths have different ways of learning. No exception students with special needs with slow learner student category. Slow learner students are students with certain obstacles that have an average I.Q of 70 [1]. Slow learner students are students who have limitations in social, emotional and cognitive interactions. Students who have been left behind or students with special needs when learning expectations are not compliant with their capabilities or the level of achievement equal to their low IQ [2].

In Indonesia, the definition of slow learner students according to Organizers of Inclusion Directorate or PSLB (2004) is a child who has the intellectual potential slightly below the normal retardation and who typically has barriers or delays in thinking, stimulation, and social adaptation - but still much better compared with the mentally disabled, but slower than normal, take a long time and require repetitions of academic and non-academic tasks. This definition is also confirmed by the Center for Curriculum Research and Teaching Ministry of National Education of Indonesia (2007): the slow learner is a child who has limitations in terms of intelligence potential, resulting in a sluggish learning process.
Almost on every lesson, slow learner students experience obstacles in learning [3], no exception in mathematics lessons. Need special methods that should be done by teachers so that mathematics lessons become easier for slow learner students. But most teachers do not realize this [4]. Teachers still use counting methods that are equated with other students. This condition affects not the achievement of learning outcomes that have been set to slow learner students. To overcome the difficulties of counting slow learner students, one of the counting methods that can be used is Jarimatika counting method (JCM). Some previous research results about JCM on counting lessons provide results that can improve the learning outcomes of mathematics [5][6]. Students have ease in learning to count [7], have confidence, motivation [8] and learn math become more fun. JCM is one of the counting methods of using the fingers and finger knuckles for the operation of the multiplication, division, addition, and subtraction [9]. Use ten fingers, with the right-hand fingers as ones and thousands, while the left-hand fingers for tens and hundreds. The JCM begins with the introduction of concepts --with concrete objects-- followed by the introduction of symbols in the finger, as well as addition, subtraction, multiplication, and division. The use of the JCM is done in fun and interesting ways, such as games and songs. So expect counting lessons do not burden the memory of the brain, and not a frightening lesson for children.

![Symbol of Jarimatika counting method for tens and hundreds][1]

**Figure 1.** Symbol of Jarimatika counting method for tens and hundreds [9]

The purpose of this study is to know that the use of JCM can improve the counting learning outcome in the mathematics of slow learner students.

2. Methodology

The approach used in this research was a single case study research method. Single case study research methods have been used in a variety of disciplines, especially psychology, special education, school psychology, and physical therapy in which they are used to determine the effects of planned interventions [10]. A single case study is effective for research that includes special needs because it is focused on the individual [11]. This method was used because the number of participants involved consisted of only five (5) slow learner students. These students need deep attention and observation to get accurate data from the research. Participants involved in this study used an inclusive primary school in West Java Indonesia. Participants consist of 5 students with special needs with slow learner student category. Another participant involved is a 2nd-grade mathematics teacher. The lesson learned was two-digit addition and subtraction.

Data were collected using observations, interviews, field notes and written tests to determine the outcomes of mathematics learning. The type of test given to the students as much as 15 essay test. Before the analysis, data from interviews and field notes were made transcripts, grouping phrases that fit the focus of the study, making coding and related categories. Data analysis was done using qualitative analysis data model [12], consisting of 3 steps: (1) thematic analysis of all participant (2) within-participant thematic analysis (3) cross-participant analysis.
### Table 1. Qualitative analysis data model

| Included Term                        | Semantic Relations | Cover Term         |
|--------------------------------------|--------------------|--------------------|
| Use of songs, gesture                | is kind of         | Enthusiasm         |
| Play together between teachers and   |                    |                    |
| students                             |                    |                    |
| Give rewards                         |                    |                    |
| Easy to move fingers                 | Is kind of         | Understanding count|
| Fast and fun                         |                    |                    |
| Asking teacher                       | Is kind of         | Curiosity          |
| Looking for the answers              |                    |                    |

### 3. Result and Discussion

#### 3.1. Result

After doing the test on all the students, got the learning result counting that is in Table 1. The students' learning outcomes are measured based on the students' mastery learning scores, especially the learning outcome for the students with special needs that have been agreed by the mathematics teacher with the principal. The score of students' mastery learning that has been set is 70.

| Number of student | Mastery learning score | Score before using JCM | Score |
|-------------------|------------------------|-------------------------|-------|
| Student 1         | 70                     | 45                      | 75    |
| Student 2         | 70                     | 50                      | 65    |
| Student 3         | 70                     | 60                      | 80    |
| Student 4         | 70                     | 65                      | 80    |
| Student 5         | 70                     | 60                      | 85    |

In Table 2, as many as 4 students or have passed the value of learning result completeness, while there is only one student who has not reached learning mastery.

Besides, the results of data analysis conducted on observation and interview data generated JCM use the profile to slow learner students in Figure 2. Profile of JCM use to slow learner students consists of 3 categories, namely: (1) showing enthusiasm in learning counting (2) understanding learning count 3) curiosity.

#### 3.2. Discussion

The results of counting the learning outcome of mathematics obtained by all students show that as many as four students have exceeded the score of mastery learning outcome, while one person has not
exceeded the mastery learning score. Although there is still one student, who has not exceeded the mastery learning outcome score, but shows that JCM can effectively improve the learning outcomes of counting lesson. This can be compared with the learning outcomes that students have acquired before using JCM.

The results of this study in accordance with the results of data analysis obtained from interviews and field notes collected by researchers. Improved counting learning outcome is supported by a sense of enthusiasm [13][14] of students and teachers in learning together that is shown in the use of songs, playing and giving rewards to students. Songs and games can give a feeling of joy to start a lesson [15], especially for slow learner students can provide motivation and enthusiasm for learning [16]. Giving rewards as a form of appreciation to students for the effort that has been done to achieve maximum learning outcomes [17], in accordance with the characteristics, weaknesses, and strengths possessed by students.

In addition to enthusiasm, JCM proved to provide an alternative counting method the easier, fun and easy to slow learner students, because the tool used is the fingers that can be used anytime. This convenience makes students quickly perform calculations in accordance with learning styles and characteristics. Counting tools in the form of fingers, allowing students to use it anytime, causing student curiosity and student enthusiasm is increasing, so from curiosity gives positive effects for students to always learn counting material at a higher level.

For slow-learner students, learning requires intense motivation and interaction [18][19], both with other students and with teachers. In addition, slow learner students also tend to need concrete objects and easy to use in understanding a concept [20][21], especially new concepts or knowledge that must be learned. The use of JCM provides an alternative counting tool that can facilitate the difficulty of counting or mathematics learning which has been very difficult to master by slow learner students.

4. Conclusion
The results of this study can be concluded that the JCM can improve the counting learning outcome in mathematics. This increase is due to the enthusiasm of teachers and students using JCM through playing, song and reward. Easy understanding because the use of fingers that can be used at any time, and the curiosity of students who can support students to always learn to count.

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