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Assessment of Mathematical Abilities of Students with Intellectual Disabilities During the COVID-19 Pandemic

Rina Maryanti*

Departemen Pendidikan Khusus, Universitas Pendidikan Indonesia, Jl.Dr. Setiabudi No 299, Bandung 40154,
Indonesia

Correspondence: E-mail: maryanti.rina@upi.edu

ABSTRACTS

The purpose of this study was assess of mathematical abilities of students with intellectual disabilities during the CoVID-19 Pandemic. The subjects of this study were 5 children with intellectual disabilities in a special school, in West Java, Indonesia. The method used descriptive quantitative method. The stages of the activity process carried out were by formulating instruments, determining subjects, conducting assessments, and analyzing data. Differences in assessment during the pandemic involved teachers and parents. The results showed that most students with intellectual disabilities have problems in the aspect of mathematical abilities. This is because students with intellectual disabilities had problems understanding abstract and complex concepts. They had problems in various aspects of perception. In the learning process, students with intellectual disabilities needed concrete media. Concrete media made it easier for students to understand learning material, especially students with intellectual barriers who are at the concrete learning stage. The results of the assessment used as the basis for making mathematics learning programs for students.

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1. INTRODUCTION

Assessment activities in the mathematics learning process for mentally retarded students are very important. This is important to do to determine the level of understanding of students. Assessment is an integral part of the science learning process (Astuti, *et al.*, 2012). Mathematics is one of the subjects related to science learning. The results of the assessment are used as a basis for making learning programs because the results of the assessment are obtained data on students' abilities, problems, and learning needs (Datnow, *et al.*, 2015).

There are several studies that discuss mathematics assessment activities, students' mathematical abilities in implementing collaborative assessment (Ulya, *et al.*, 2019), the importance of mathematical modeling in mathematics learning (Kurniadi & Purwaningrum, 2018), developing mathematics learning models for students having difficulty learning in inclusive elementary schools (Tarjiah, 2015), analysis of mathematical representations. in terms of creativity in cps learning with diagnostic assessment (Permata, *et al.*, 2017), and open-ended problem solving assessment to measure the profile of students' mathematical creative thinking based on gender (Sadijah, *et al.*, 2017). However, until now there has been no study that describes the assessment of students' mathematical ability activities with intellectual disabilities during the CoVID-19 Pandemic.

Therefore, the aim of this study is to determine the Assessment of mathematical abilities of students with intellectual disabilities during the CoVID-19 Pandemic. We used descriptive quantitative methods. The steps taken were the formulation of the instrument, determining the subject, conducting the assessment, and analyzing the data. The novelty in this research is the activity process stages involving teachers and parents, research subjects are children with intellectual disabilities, and the conditions of research activities carried out during the COVID-19 pandemic. The results of the assessment are needed as a basis and reference for making learning programs for students (Maryanti, *et al.*, 2020a). The results of this study are expected to become a reference for educators in carrying out assessment activities during a pandemic.

2. METHODS

The subjects of this study were 5 students with intellectual disabilities in an special needs school, West Java, Indonesia. The research method used is descriptive quantitative. **Figure 1** describes the research procedures carried out including the formulation of the mathematics ability assessment instrument, determining the research subject, conducting the assessment, and analyzing the assessment data.



Figure 1. Describes the research procedures

To find out the math abilities of mentally retarded students, we conducted data collection techniques using activities, tests, interviews, and observations. Parents and teachers were involved in the assessment process because during the COVID-19 pandemic, students did not go to school.

3. RESULTS AND DISCUSSION

3.1. Students demography

Figure 2 shows the abilities in the development aspects of student with intelligence barriers. Student A had quite good visual and auditory perception, concentration, and motor skills, but he had poor communication skills. Student B had quite good visual and auditory and motor perception skills, but student B had poor concentration and communication skills. Students C, D, and E had poor visual and auditory perception, concentration, and communication skills, but quite good motor skills. The intellectual barrier possessed by students with intellectual disabilities results in several problems in the developmental aspect (Maryanti, *et al.*, 2020a).

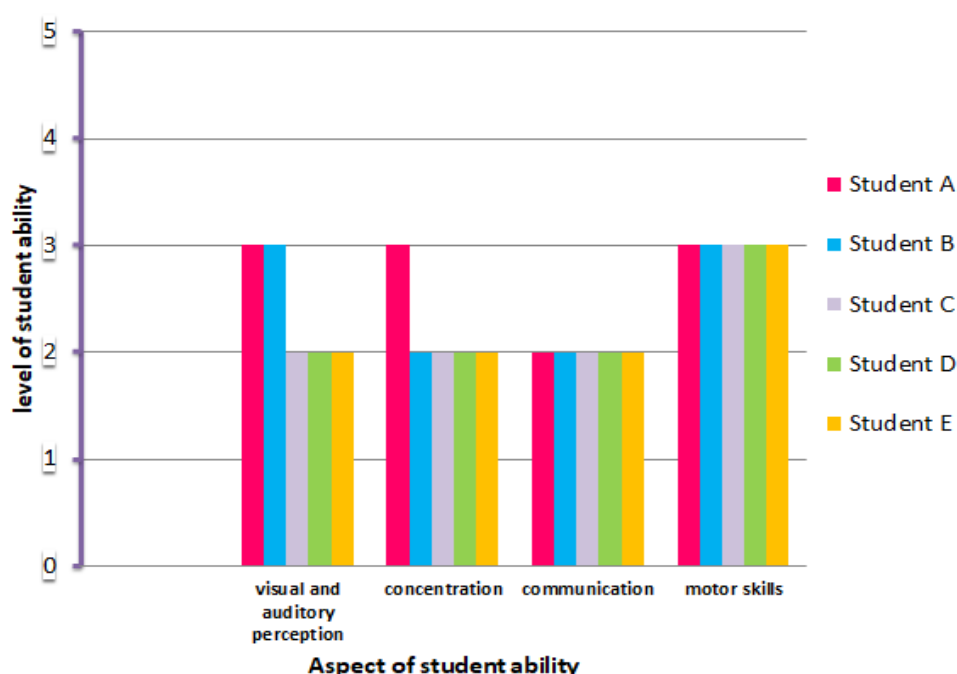


Figure 2. Student Demography.

3.2. Process and analysis result data

An effective mathematics learning process carried out according to the needs of students. The needs of these students were obtained through assessment activities. Assessment is a process of activities carried out to find out data on students' abilities, problems, and needs (Datnow, *et al.*, 2015). The assessment process was carried out through the stages of instrument formulation, determining the subject, conducting the assessment, and analyzing data.

At the instrument-making stage, we conducted literature and field studies. We made assessment instruments based on curriculum and developmental milestone. The process of curriculum analysis is important in academic assessment activities, especially the assessment of mathematical abilities (Fagginger Auer, *et al.*, 2016).

At the stage of determining the subject, we determined the student's subject with an intelligence level. Students with intellectual disabilities are students with special needs who have problems in intellectual aspects and adaptive behavior (Maryanti, *et al.*, 2020b). The characteristics of these barriers cause various problems in the learning process (Maryanti, *et al.*, 2021a). One of them is in the mathematics learning process.

The assessment activities are carried out by means of interviews, observations, and tests. At this stage, we involve parents and teachers. The involvement of parents and teachers is very important, this has the aimed of making the student profiles obtained more accurate (Maryanti, *et al.*, 2020c). In addition, during the CoVID-19 pandemic, the learning process was not carried out in schools.

Figure 3 explains the results of the data analysis showing that students A and B have poor abilities in the arithmetic and geometric aspects, but have less good abilities from the measurement aspect. Meanwhile, students C, D, and E have poor skills in arithmetic, geometry, and measurement aspects. This is because students with intellectual disabilities need concrete learning media in the learning process .

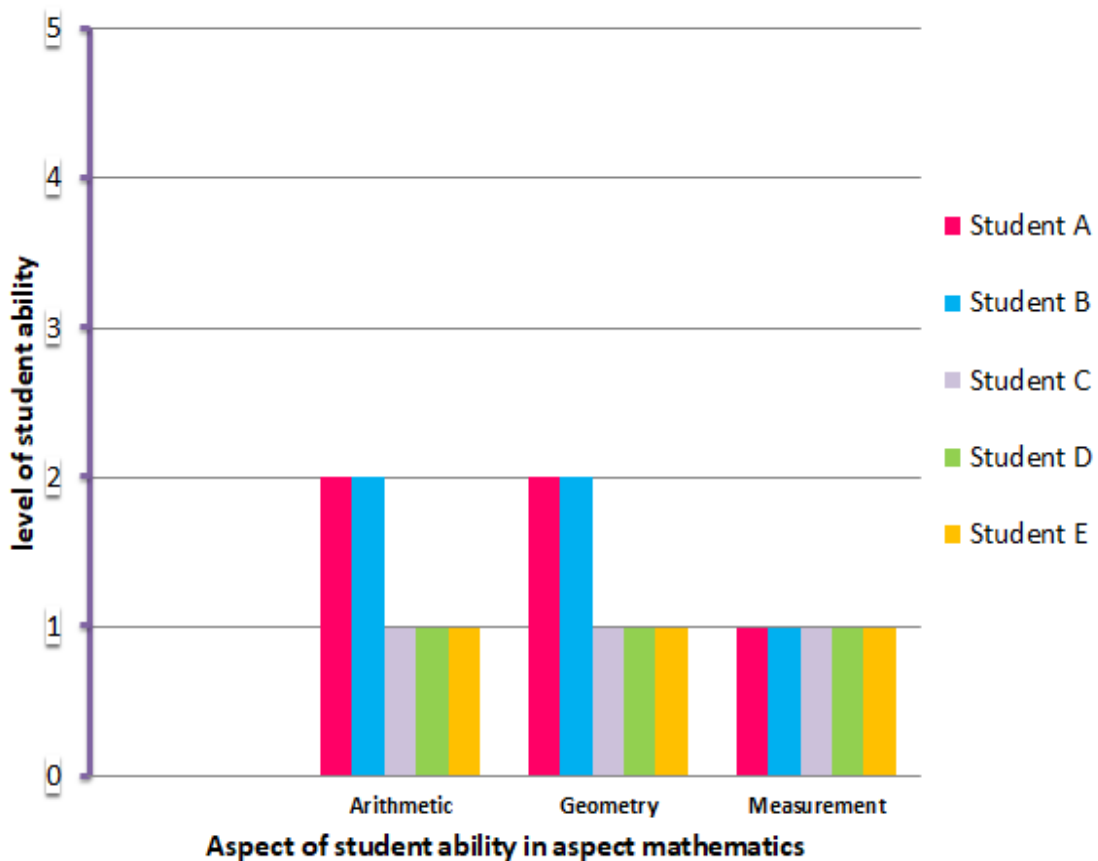


Figure 3. Students' mathematical ability.

The research data showed that students with disabilities have low abilities in the mathematical aspect. This would be seen from the arithmetic, geometry, and measurement abilities which are at a less than good level. Students are at the concrete learning stage so they need concrete learning media as well. They find it difficult to understand abstract and complex material (Maryanti, *et al.*, 2021b).

4. CONCLUSION

In the assessment of students' mathematical abilities with intellectual disabilities during the CoVID-19 Pandemic, the objective is to determine the level of students' abilities. 5 students with intellectual disabilities were the subjects of this study. We used descriptive quantitative methods. We carry out an assessment process, namely the formulation of instruments, determining the subject, conducting the assessment, and analyzing data. Teachers and parents are involved to facilitate assessment activities during a pandemic CoVID-19. The results showed that most students with intellectual disabilities had problems in the aspect of mathematical abilities. Students with intellectual disabilities had problems understanding abstract and complex concepts. They were at the concrete learning stage.

5. CONFLICT OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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