

# Mathematics Learning Media and the Need for Montessori Media Development for Students with Mild Mental Retardation in Class IV at SLB Makassar City

Isa Bela Islami<sup>1,\*</sup> Gunarhadi Gunarhadi<sup>2,3</sup> Sri Yamtinah<sup>3</sup>

<sup>1,2,3</sup> Universitas Sebelas Maret, Indonesia

\*Corresponding author. Email: [Isabelaislamia015@gmail.com](mailto:Isabelaislamia015@gmail.com)

## ABSTRACT

This research is motivated by problems in children with mild mental retardation 4th graders at SLB Makassar city who still do not understand basic mathematical concepts in calculating addition. This study aims to determine the needs of mathematics learning media to find out the learning media used in SLB Makassar and to find out the need for learning media based on the montessori method. This study uses a descriptive qualitative approach. Subjects studied in this study are 10 teachers who teach in several special schools in Makassar. The data collection technique used is a questionnaire with nine questions. This study uses a qualitative descriptive analysis technique. The results showed that the learning media used in schools still using 2D and 3D Montessori media and still requires Montessori-based media to be innovated and developed. So, can be concluded that the need for the development of learning media with media more modern, more interesting and keep up with technological developments and implemented with fun games and cognitively stimulating mild mentally retarded class IV students.

**Keywords:** *Needs Analysis, Learning Media, Montessori Method, Basic Math Concepts, Mild Mental Retardation.*

## 1. INTRODUCTION

Extraordinary schools or commonly known as SLB is schools that carry out special learning processes for students whose conditions are different from ordinary students. These different situations require different treatments during the learning process. Article 31 paragraph 1 of the 1945 Constitution of the Republic of Indonesia stipulates that every citizen has the right to education. According to Yustiani (2009), including the right to education, namely not seeing the condition of students in the future, both in normal physical condition and with special needs, such as blind, deaf, mentally disabled, autism, and quadriplegic [1].

Mild mentally retarded child is the child with special needed with an intelligence level between 55 to 70 ( Soendari, Tjutju. 2006.) [2]. Cognitive level of students aged 14 years with mild intellectual disability equivalent to a fifth grade elementary school student at a specific operational stage ( Sigit. 2009 ) [3]. Students belonging to children with special needs often fail and have difficulty understanding the basics of mathematics. They often have learning difficulties and maintain fluency in

math skills. This is because cognitive development of mild mentally retarded students is still in the specific operation stage. Students have difficulty when faced with abstract things (Delphie, Bandi. 2009) [4]. Mild mentally retarded children are more helpful when learning mathematics, with objects and everyday problems around him.

*American Assosiation Of Intellectual Developmental Disability (AAIDD) [5] in (Dalam P. Hallan et. all. 2011: 147) defines as follows:*

*Mental retardation is a disability characterized by significant limitations both in intellectual functioning and in adaptive behavior as expressed in conceptual, sosial and practical adaptive skills. This disability originates before age 18.*

The description above can be interpreted that:

Mental retardation is an impairment characterized by significant limitations in both intellectual functioning as well as in adaptive behavior as stated in conceptual adaptive skills, social, and practical. This barrier occurs before the age of 18 years. Rochyadi and Alimin (2003:11) “mental retardation is closely related to

intelligence development problems which is low and is a condition” [6].

In the field of education, teacher is a very important determinant in general education, because the teacher plays a role in the learning process, and the learning process is the core of the entire educational process. The learning process is a series of actions involving mutually beneficial relationships between teachers and students in the context of education to achieve certain goals, including the dual role of the teacher.

The learning process begins with someone who has the ability to read, count and write. Counting is an ability that every child has in terms of mathematics such as sorting numbers or counting activities and about the amount to develop skills indispensable in everyday life, which is also the basis for developing mathematical abilities as well as readiness to participate in basic education for children. Without the ability to count, students will experience many difficulties in daily life in terms of buying and selling, it also has a lasting impact on children in terms of adding natural numbers by storing at the next grade level so that it does not provide good development in terms of children's academics.

Mathematics is the basis for solving all aspects of life. So, mathematics is a subject which cannot be separated from the study of the concept of numbers and addition. Addition is a mathematical concept which children must learn before subtraction. Although addition and subtraction are basic materials that are interrelated. If students still cannot understand the concept of addition, then it will be difficult for him to finish the material after, because the material after the addition will be closely related to the basic addition that the concept needs to be understood first [7].

Susanto (2011 : 95) give the meaning of counting is every child's abilities to develop their abilities, characteristics of development starting from the environment closest to him, in line with the development of his abilities the child can increase to the stage of understanding the number, related to addition and subtraction [8].

Every branch of mathematics can be linked with an idea of a certain physical quality. This should exist in everyday human life. Therefore to introduce mathematics to children have to dig two things first, that is to explore and receive thoughts about the existence of a separate quality thing and practice to hone the intellectual skills needed. First, so that the child recognizes the idea of things and the separation of qualities. They have been provided with sensory activities beforehand. Second, so that children have the necessary intellectual skills. Children are trained from various cognitive aspects in mathematical and sensory activities. Like pouring peanuts from a teapot to more complicated ones (Montessori, 2008) [9].

Counting games need a fun atmosphere and provide a sense of security and freedom for children. For that, props are needed/ media that corresponds to the real thing (imitation), interesting and varied, easy to use, and no harm. On the other hand the language used in the introduction of the concept of counting simple language should be and if possible take samples found in the surrounding environment. The use of learning media in the teaching and learning process can generate new interests for students, generate motivation and stimulation during learning activities, and even bring psychological effects on students.

The Montessori method is a method applied to children who are in the lower grades, this method is part of the development of educational theories accompanied by the theory of child development. Basically this method prioritizes the stages of child development. The method emphasizes more on the activities shown by the child's self with the help of materials or tools designed and emphasizes the process of adapting the child's learning environment appropriate to their level of development. In this case physical activity is very important for help the process of absorbing learning concepts and gaining practical abilities. In this case Montessori stated that Education must be in accordance with the child's development based on a certain age by paying attention to the individual development stage of the child (Montessori, 2008) [9].

Media is everything used to represent a material to be delivered with various tools both in the teaching and learning process or in everything which requires a medium. There are many kinds of media in learning and their uses. Therefore, researchers conduct a need assessment of learning media which is considered modifiable in supporting the ability to understand basic mathematical concepts in grade IV mild mentally retarded students in accordance with the academic needs of mentally retarded children.

Using learning media as an alternative, can be used to distribute material from master to students. The use of learning media can improve the quality of education. One of the principles of using learning media is convey to students the perception of the information conveyed by the master to students. Learning media must be designed and developed according to the characteristics of media users. This is done to optimize the distribution of expositions of information from masters to students. (Sudjana and Rifa'i, 2011) [10].

Gagne argues that media is various types of components in the student environment which can stimulate him to learn (in Arsyad, 2002) [11]. Meanwhile, according to Willbur Schram media is messenger technology which can be used for learning purposes (in Arsyad, 2014) [12].

Themes that are packaged as learning media must also adapt to media users, as well as the design of learning media. The material in the learning media must be short, dense, and easily understood by media users. Designed to allow media users to learn independently when using learning media. In developing learning media, we must really pay attention to the use of sentences and the composition of the material. (Mayer, 2003) (Sadiman, 2007) (Diergarten, Möckel, Nieding and Ohler, 2017) [13][14].

Along with the increasing role of educational media, then educators and educational media must be interrelated with each other to provide learning facilities for students. In the sense, that educators as facilitators are expected to be able to function as optimally as possible educational media according to the expected goals. Individual attention and guidance can be given by educators properly, while educational media can also be presented in a clear, interesting, and appropriate. Therefore, become a must for schools that provide education special or ordinary called Extraordinary School to place educational media as an important component of its education system.

It's been all this time educational media has been enriched by the existence of textbooks, modules, overhead projectors, films, videos, television, slides, and so on. But the media seems not enough to motivate and develop children's attitudes and abilities, interests, talents, and mentally to reach their ideal potential. This is where the modification of learning media is needed according to the potential and level of needs of the students. In operation, the development of educational media should also be pursued to take advantage of the advantages possessed by the media and trying to overcome the obstacles that may arise in their learning expositions. Therefore, as a good and professional facilitator, educators should be able to operate and choose educational media that will be used appropriately in schools providing mental retardation education.

There are several relevant studies that have carried out the same research, with almost the same result that is research entitled Interactive Multimedia for Students with Special Needs which is conducted by Mukhammad Luqman Hakim in 2020 [1]. Then there is also a study entitled Analysis of Learning Media Needs to Improve Numerical Skills conducted by Siti Suprotun and Suparman in 2018 [15]. Both studies show the results that the need for more innovative learning media, interesting and fun are needed by teachers in Special Schools.

Based on the above background This study aims to analyze the needs of learning media for knowing the need for mathematics learning media for knowing the learning media used in Extraordinary School Makassar City and to find out the need for learning media based on the Montessori method. Media that are considered capable of running with technological developments and the needs

of these children are expected to help the teacher's role in the learning process, the use of this media is also expected to be able to develop the learning creativity of mentally retarded students

## **2. RESEARCH METHODS**

This research use descriptive qualitative approach. This approach is intended to determine the learning media used in Extraordinary School Makassar City and to find out the need for learning media based on the Montessori method which exist in Extraordinary Schools Makassar City in improving the understanding of basic mathematical concepts in mentally retarded students. The data collection technique in this study used a closed questionnaire aimed at 10 Special School teachers in Makassar. There are two indicators analyzed in this study, namely the learning media that has been applied in Extraordinary School in improving basic math skills for students with mental retardation, and the need for mathematics learning media based on montessori in Extraordinary School Makassar City.

## **3. RESULTS AND DISCUSSION**

Fill in the questions in the google form questionnaire distributed by the researcher, is divided into three parts, namely:

### ***3.1. Learning Media used in Extraordinary School in learning Mathematics for students with mild mental retardation***

Based on several questions and statements, the results of the questionnaire show that eight teachers stated that so far the learning media used still using media 2D, 3D, but still not attracting students' attention in its application so that the achievement of basic mathematics material for mentally retarded students is less than optimal. While the other two teachers mentioned that so far, they have also used the old Montessori learning media in the form of 2D and 3D, but they take advantage of advanced technology to support the delivery of class material. However, overall results regarding the learning media used in the Extraordinary School is a monotonous learning media in the form of 2D, 3D media but considered unattractive and unable to attract the attention of mentally retarded students. So that the concept of learning that must be conveyed by the teacher to students through learning media must use more interesting media, innovative and developed in accordance with the times.

### **3.2. The Need for Learning Media Based on the Montessori Method**

Montessori media is one of the most widely used media in Extraordinary School which is in Makassar, it's just that innovation needs to be done on the Montessori media so that it can attract the attention of students with mild mental retardation in improving the ability to understand basic mathematical concepts. Of the ten respondents in this study, expects that if the Montessori media is upgraded or innovated into something fun and interesting, it will be able to improve the ability to understand basic mathematical concepts in fourth grade mentally retarded students.

There are several relevant studies that have carried out the same research, with almost the same results, namely a study entitled Interactive Multimedia for Students with Special Needs conducted by Mukhammad Luqman Hakim in 2020. Then there is also a study entitled Analysis of learning media needs to improve numerical abilities which was carried out by Siti Suprotun and Suparman in 2018 [15]. Both studies show the results that the need for more innovative learning media, interesting and fun are needed by teachers in Special Schools. This shows that from the two studies there are similarities in results with this study, in the form of needed Montessori media that is developed and innovated in order to be able to attract the attention of mentally retarded students.

### **3.3. Discussion**

The analysis that has been carried out from the google form questionnaire gets the results in the form of the need for learning media that are adapted to technological advances and also in accordance with the needs of mentally retarded students in Extraordinary School. To achieve learning outcomes with learning media, teachers need to find references and applications of learning media that are fun and attract attention for mentally retarded students in teaching and learning activities. Because mentally retarded students need to learn a material by repeating and concrete examples are given in everyday life as a provision to know the environment and practice self-care and some simple skills.

The material in the learning media must be short, dense, and easily understood by media users. Designed to allow media users to learn independently when using learning media. In developing learning media, we must really pay attention to the use of sentences and the composition of the material. (Mayer, 2003) (Sadiman, 2007) (Diergarten, Möckel, Nieding and Ohler, 2017) [13][14]. So far, educational media has been enriched by the existence of textbooks, modules, overhead projectors, films, videos, television, slides, and so on. But the media seems not enough to motivate and develop children's attitudes and abilities, interests, talents, and mentality to

reach their ideal potential. This is where the modification of learning media is needed according to the potential and the level of needs of students (Hakim, Luqman Muhammad, 2008) [1]. Therefore, learning media must be designed and developed according to the characteristics of media users. This is done to optimize the distribution of expositions of information from masters to students. (Sudjana and Rifa'i, 2011) [10].

## **4. CONCLUSIONS AND SUGGESTIONS**

Based on the results and discussion above, it can be concluded that So far, the application of the media used in Extraordinary School Makassar City is a Montessori media with 2D and 3D media types. From the learning media, it turns out that it has not been able to attract the attention of students in the implementation of learning. So that teachers need innovative learning media, in accordance with the times and packed with interesting and fun games. Most of the respondents said that by creating fun learning media, according to the characteristics of mentally retarded students and play with fun games, then students will be easier to accept and understand the material presented by the teacher. Therefore, The development of Montessori-based mathematics learning media is very much needed by Extraordinary School teachers in Makassar city.

Based on the results of the research, discussion, and conclusions above on "Mathematics Learning Media and the Need for Development of Montessori Media for Class IV Mild Mentally Impaired Students at Special Schools in Makassar City" then the following suggestions can be given:

1. Principals are expected to encourage teachers to always creates a pleasant classroom atmosphere as well as able to use learning media in accordance with the times but do not forget the target of the material to be delivered.
2. Teachers are expected to be able to present learning media with interesting media and packed with games that can attract the attention of mentally retarded students.
3. For researchers, hopefully this research can be useful as a reference for further research.

## **ACKNOWLEDGMENTS**

The authors would like to thank Sebelas Maret University for the support and assistance to this research program. My gratitude also goes to the head program of Special Education for his attention for facilitating research activity.

## **REFERENCES**

- [1] Mukhammad Luqman Hakim. 2020. *Multimedia Interaktif Bagi Siswa Berkebutuhan Khusus*. Di

- akses melalui online pada website seminar.uad.ac.id/index.php/sendikmad/article/download/984/pdf pada tanggal 23 Oktober 2021.
- [2] Soendari, Tjutju. 2006. Pendekatan Realistik dalam Meningkatkan Kemampuan Matematika Anak Tuna grahita ringan Di Sekolah Luar Biasa. Laporan Penelitian Mandiri. Vol 1 (1): 42. [serial on line].  
[http://file.upi.edu/Direktori/FIP/JUR. PEND. LUAR BIASA/195602141980032TJUTJU SOENDARI/Artikel/Artikel\\_Pend.pdf](http://file.upi.edu/Direktori/FIP/JUR._PEND._LUAR_BIASA/195602141980032TJUTJU_SOENDARI/Artikel/Artikel_Pend.pdf). [30 Maret 2014] .
- [3] Sigit. 2009. Kesulitan Belajar, Lambat Belajar, TunaGrahita, Gifted Disinkroni. [on line]. <http://gulit1.wordpress.com/2009/03/05/kesulitan-belajar-lambat-belajar-tunagrahita-gifted-disinkroni/> . [24 Mei 2009].
- [4] Delphie, Bandi. 2009c. Matematika untuk Anak Berkebutuhan Khusus. Klaten: PT Intan Sejati
- [5] AAIDD (Online) <https://aaid.org/>. Rabu, 26 Februari 2019. Pukul 06.00 WITA.
- [6] Alimin, Z. dan Rochyadi, E.. 2003. *Pengembangan Program Pembelajaran Anak Tunagrahita*. Jakarta: Direktorat Pendidikan Tinggi Departemen Pendidikan Nasional.
- [7] Zahara, L, Taransyah, dan Efrina, E. 2013. *Efektifitas Media Ceker-Ceker Untuk Meningkatkan Kemampuan Operasi Hitung Bagi Anak Tunagrahita Ringan*. *Jurnal Ilmiah Pendidikan Khusus*. 2013. 2 (3): 176-187.
- [8] Susanto, Ahmad. 2011. *Perkembangan Anak Usia Dini Pengantar dalam Berbagai Aspeknya*. Jakarta: Kencana Perdana Media Group.
- [9] Maria Montessori, (2008). *The Absorbent Mind (Pikiran Yang Mudah Menyerap)*, Yogyakarta: Pustaka Pelajar.
- [10] Sudjana, N., & Rifa'i, A. (2011). *Media Pengajaran*. Bandung: Sinar Baru Algesindo.
- [11] Arsyad, A. 2002. *Media Pembelajaran*. Jakarta: Raja Grafindo Persada.
- [12] Arsyad, A. 2014. *Media Pembelajaran Edisi Revisi*. Jakarta: Rajawali Pers.
- [13] Mayer, R. E. (2003). The promise of multimedia learning : Using the same instructional design methods across different media. *Learning and Instruction*, 13(2), 125-139. <https://doi.org/10.1016/j.appdev.2016.11.007>
- [14] Sadiman, A. S. (2007). *Media Pendidikan Pengertian, Pengembangan dan Pemanfaatannya*. Jakarta: PT. Raja Grafindo Persada.
- [15] Siti Suprotun dan Suparman. 2018. *Analisis kebutuhan media pembelajaran untuk meningkatkan kemampuan numerik*. Diakses secara online melalui website [etheses.uin-malang.ac.id/3799/1/12410206.pdf](http://etheses.uin-malang.ac.id/3799/1/12410206.pdf) pada tanggal 23 Oktober 2021.