IMPROVING THE MATHEMATICS LEARNING ABILITY OF CURRENCY VALUES THROUGH THE IMPLEMENTATION OF DIGITAL WHITEBOARD MEDIA FOR STUDENTS WITH MILD INTELLECTUAL DISABILITIES

Nurhasanah[1], Endang Rochyadi[2], Iding Tarsidi[3]
nurhasanahsulaiman71@gmail.com[1], endangrochyadi@upi.edu[2], idingtarsidi@upi.edu[3]
UPI Bandung

ABSTRACT

The aim of this research is to present the use of digital whiteboard media to improve the learning abilities of mentally retarded student in learning mathematics about currency values. This research was carried out at SLB Negeri Kab. Cirebon. The method used in this research is a qualitative descriptive method. The instruments in this research are interviews, observation, documentation and tests. Based on the research results, it was revealed that through the use of digital whiteboard media, students' currency value mathematical abilities can increase significantly. Whiteboard digital media is an interactive web-based learning media that can involve students directly in its use and can help mentally retarded students overcome their learning problems related to understanding concepts and how to calculate the money used. Thus, it can be concluded that the digital whiteboard media is very representative for use as a learning medium, especially in currency values learning for mentally retarded student.

Keywords: *Whiteboard digital, Currency Values, Mentally Retarded Students.*

INTRODUCTION

Technological progress is increasingly rapid with the declaration of the era of society 5.0, demanding that the world of education, especially teachers, be able to adapt the presentation of learning to suit the demands of the technological era so as not to be left behind by the progress of the times. The students we are currently facing are generation Z or millennial generation students who are used to being involved in using gadgets, so they are even more skilled at fiddling with gadget use. The use of gadgets is also endemic to students with intellectual disabilities. In almost everyday life, they cannot be separated from their cellphones, especially on social media applications. Mentally retarded students who significantly have intellectual intelligence that is below normal intelligence are also able to use cellphones quite well. Therefore, as an educator, teachers should be able to better master these technological advances in order to support increasing students' learning competencies by integrating technology into learning. A teacher is required to be creative in utilizing technological advances so that he can make a positive contribution to students' learning progress which is increasingly facilitated by the presence of technology. In this way, students are expected to have 21st century life skills related to technological advances that are developing very rapidly.

Students with intellectual disabilities are the current term known as mentally retarded. The American Association on Intellectual and Developmental Disabilities (AAIDD, 2010) defines children with intellectual disabilities as follows. Intellectual barriers are disabilities that are characterized by intellectual incapacity both in terms of intellectual and adaptive behavior which is reflected in social and adaptive skills. This disability begins before the age of 18 years. Children with intellectual disabilities are children who have disabilities in intellectual function and adaptive behavior. Intellectual function refers to mental capacity/ ability, including abstract thinking and problem solving. Meanwhile, barriers to adaptive behavior are related to conceptual abilities, social

abilities and practical abilities that can be used in everyday life. Among the conceptual abilities of students with intellectual disabilities are abilities related to the concept of money, while among the practical abilities of mentally retarded children is the ability to manage or use money.

The low intellectual capacity of mentally retarded students causes students to experience obstacles in their adaptive abilities, especially in the development of conceptual skills and practical skills, namely in understanding the concept of currency values and in counting money. The characteristics of mentally retarded students who easily forget, lack motivation, avoid things that require thinking and weak concentration who are easily distracted, are the concern of teachers in providing learning services, especially in mathematics learning currency values which must be adjusted to the characteristics of students which is the cause. main obstacle to learning. With the complex characteristics of mentally retarded students, teachers are required to be able to design appropriate learning strategies so that they can overcome their learning obstacles.

Mathematics is a difficult learning for mentally retarded students. Wijaya (2013) argues that, children with intellectual disabilities are also called children who experience developmental obstacles intellectual property. Intellectual development barriers experienced by children with intellectual disabilities cause children have various obstacles in their learning. Especially in following academic learning is in mathematics learning. Mathematics learning is one of the core subjects that is challenging, this is because children learn abstract concepts that are difficult to understand. Mathematics is a substantive field of study that supports problem solving in all sectors of life. For this reason, students with mentally retardation also need to be given mathematics lessons so that mathematical knowledge can be applied in children's daily life activities functionally so that students are expected to be able to solve the problems they face. A special form of service is provided in the form of mathematics learning that is modified to be concrete and functional in order to overcome their intellectual barriers. To make it easier for mentally retarded students to learn mathematics, especially in the currency value material, researchers designed a learning strategy by implementing a web/ technology-based application media which is expected to be more motivating and easier for children to understand concepts and apply them interactively. The technology-based application media used is very representative in accommodating students' needs in understanding the concept of currency value and in calculating money, because there are icons that really support understanding the concept of currency value. The learning application media used is called Digital Whiteboard.

Money is a unit of value or standard price measurement in goods and services transactions. With money as a unit of value, it makes it easier to carry out transactions in society's economic activities. Meanwhile, currency is a means of payment for economic transactions used in a country and the currency in Indonesia is the rupiah. In general, money has a function as an intermediary for the exchange of goods and also to avoid trade by bartering. The currencies in Indonesia are each worth hundreds, thousands, tens of thousands and hundreds of thousands. The use of money for mild mentally retarded students are more functional characteristic, so that children can apply their knowledge acquired regarding the value of currency in order to function in their daily lives, children can engage in economic transactions according to their abilities and needs in society. Teaching related to the concept and use of money for mentally retarded students can be carried out in stages starting from the lowest nominal amount and carried out repeatedly.

Digital Whiteboard is a technology-based learning application media in the form of a miniature whiteboard that can be used digitally via smartphone. An interactive digital

whiteboard is a technological device that combines the functions of a traditional whiteboard with interactive capabilities. This device allows teachers and students to interact with learning content through touch, writing and images. This is in accordance with the opinion of Kent (2018) who stated that interactive whiteboards use sensor technology and special software that allows users to write, draw or control the display using a pen or finger. Thus, interactive whiteboards create a more dynamic and engaging learning experience. Becta (2003, 2004, 2006) argues that, interactive whiteboards (IWB) have become one of the most striking indicators of digital technology adoption in education over the last decade. As with many other technologies that have been adapted for education in the last century, the use of interactive whiteboards is often claimed to have caused a transformation or revolution in approaches to learning (Beetham & Sharpe, 2007; Betcher & Lee, 2009; Kuba, 1986, 2001).

Whiteboard digital media is quite easy to use for mentally retarded students, with repeated practice in using it, students will be proficient in using it. But it still requires teacher or parent supervision. On the digital whiteboard media, there are icons that are very suitable for learning the mathematics of currency values, making it easier for mentally retarded students to understand the concept of currency values and to count money. The icons available include the ink icon which is a pen that functions as a writing tool/ pencil used to write or complete money calculations, an eraser icon to correct writing errors, an image icon that can access questions and/ or money images stored in the gallery, a duplicate icon that can be used to duplicate images of money and other icons. Whiteboard digital media is an interactive learning media because students can use it directly, thereby motivating and challenging students to study more actively through the use of technology- based learning media.

In modern learning which increasingly adopts technology, interactive digital whiteboard applications are the right solution for integrating interesting and fun learning approaches in the classroom so that it can increase students' motivation, abilities and learning outcomes. This is supported by the statement of Yalin H (2010) which states that, currently the use of computers, television, radio, video presentations and interactive whiteboards which are all technologically available enables increased learning as a support for learning in the teaching and learning process. The use of learning tools in the form of interactive digital whiteboard applications helps in explaining concepts, showing examples and facilitating active learning. Utilizing technological advances in the form of digital whiteboard applications as a learning medium also allows access to interactive learning materials, simulations and independent training. The use of interactive whiteboards in the learning process creates opportunities to use different teaching methods in the classroom.

Technology has opened many opportunities in our daily lives, by providing many technological tools. Coal (2021: 327, in Jannah & Atmojo, 2022) states that, digital learning environments are a learning environment that creates a digital icon can be managed, used and shared through units digital. According to (Purwati, 2021; Nurdyansyah, 2019: 94-100), digital learning environments are also referred to as multimedia is a type of learning environment that can foster the desire to learn students against teaching materials using digital media in the form of video, images, sound, and animation. Munir (2017: 4) added that, learn with digital media can enable learning that richer, more diverse and learning can be studied anytime, anywhere without distance restrictions, time and space. Based on the statements of the experts above, it can be concluded that, the digital learning environment can foster students' learning desire for teaching materials using digital media so that learning becomes richer, more diverse. Digital media can studied without time and/ or distance restrictions.

METHODS

This research uses a qualitative descriptive method on the grounds that this method is relevant to the problem being researched and can describe the situation that existed at the time the research took place regarding the use of digital whiteboard application media in improving the abilities of students with intellectual disabilities in learning currency value mathematics. Suharsimi Arikunto (2005) emphasized that descriptive research is research intended to collect information regarding the status of existing symptoms, namely the state of symptoms according to what they were at the time the research was conducted. Thus, it can be concluded that descriptive research is research to collect information regarding the data to be researched in accordance with objective conditions at the time the research was carried out.

Data collection in this research used 4 types of methods, namely interviews, observation, documentation and tests. Interviews in this research were conducted to determine the child's initial condition and the obstacles or difficulties that parents experience in teaching children about the use of money in daily activities. Observations in this study were intended to observe and record the subject's behavior before and during the intervention process and were carried out at school. The type of observation in this research is checklist observation. The target observations in this research include: 1) differentiating how to write thousands, tens of thousands and tens of thousands of money up to IDR 20,000, 2) ability to exchange money for denominations worth up to IDR 20,000, 3) ability to add money up to IDR 20,000, and 4) ability reduce money up to IDR 20,000. Researchers will record the frequency of occurrence of behavioral indicators and recapitulate them after each intervention is given. The documentation used in this research is in the form of photos and videos of the process of implementing the subject intervention which is used as a source of research data. The form of test used in this research is an assessment of the subject's abilities in the mathematics learning material of currency values through the use of digital whiteboard media.

The research technique used in this research uses descriptive qualitative data analysis techniques and looks at changes in the subject's behavior during the research process. This research was conducted at SLB Negeri Kab. Cirebon which is located in Cirebon. There was 1 participant in this study, namely a student with mild intellectual disabilities at junior high school level who was 18 years old. The material used in this research is digital whiteboard application media.

RESULTS AND DISCUSSION

The learning media used in this study is a digital whiteboard application. Digital whiteboard is a whiteboard-shaped learning media that can be used digitally. This device allows teachers and students to interact with learning content through touch, writing and images. Whiteboard digital media is a technology-based learning media used to help students with intellectual disabilities to understand concepts and in counting money. Whiteboard digital (microsoft whiteboard) media can be downloaded through the Playstore application on mobile devices. This media is equipped with questions and pictures of money stored in the mobile phone gallery. Here's what the whiteboard digital app media looks like.

Picture 1. Digital Whiteboard Opening Display

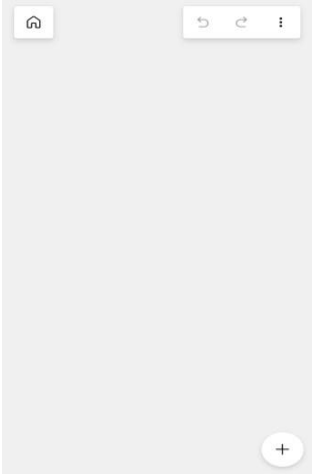
Microsoft

Picture 1 is the opening display of the whiteboard digital application. In the opening screen there is a pencil drawing in a blue box that serves to enter the application.

Picture 2. Start Menu Digital Whiteboard Display

Picture 2 displays a positive symbol which if clicked will enter the initial menu of the digital whiteboard application.

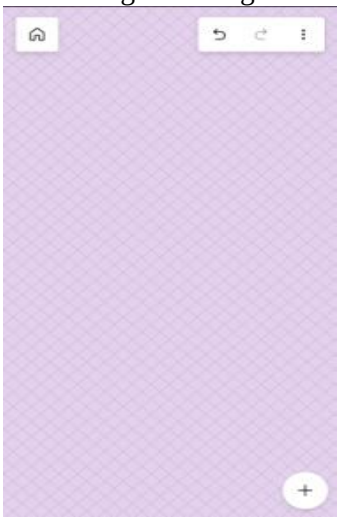
Picture 3. Whiteboard Digital Display



Picture 3 there are several symbols, including the home symbol, the three-point

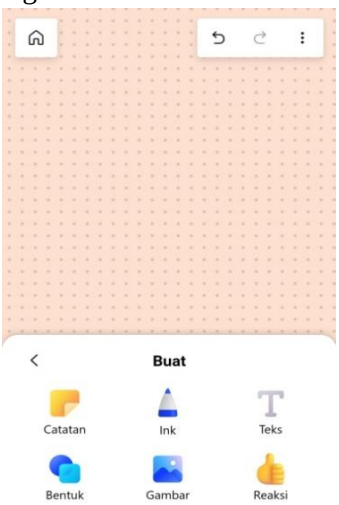
symbol (⁝) and the positive symbol. Click the ⁝ symbol to change the background format (colors and templates).

Picture 4. Whiteboard Digital Background Format Display



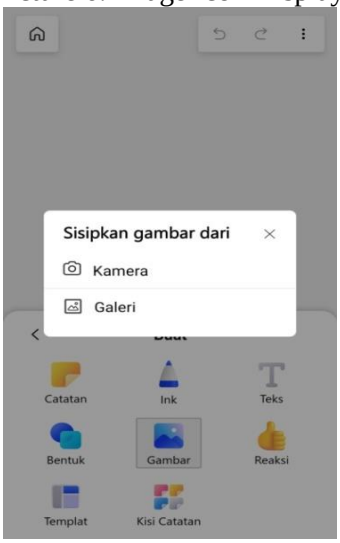
Picture 4 displays digital whiteboard display that has changed color. Click on the positive sign to go to the main menu.

Picture 5. Digital Whiteboard Main Menu Display



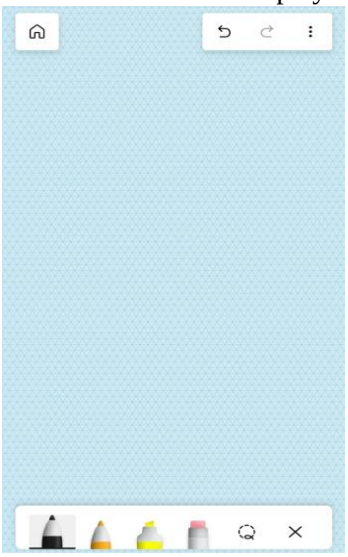
Picture 5 In the main menu display, there are several icons, including ink icon and image icon. Click the image icon to access the gallery or ink icon to display pencil icons and eraser icon.

Picture 6. Image Icon Display



Picture 6 there is a camera icon and a gallery icon. Click the gallery icon to upload questions and/ or pictures (money).

Picture 7. Ink Icon Display



Picture 7 there are colorful pencils icon that when clicked serves to write/ solve problems and an eraser icon that serves to correct errors.

Picture 8. Problem Work Menu Display

Picture 8 displays how to calculate shopping price, namely through addition/ subtraction using downward stacking technique.

Picture 9. How To Exchange Money Display

Picture 9 display how to exchange money for denominations of money worth by duplicating as many denominations as requested.

The subject in this study was 1 female student with an intelligence level of 63 based on the results of psychological test assessments. The activity was carried out over 10 meeting, learning took place using digital whiteboard learning media on SMPLB level student currency value mathematics learning and was carried out at SLBN Kab. Cirebon.

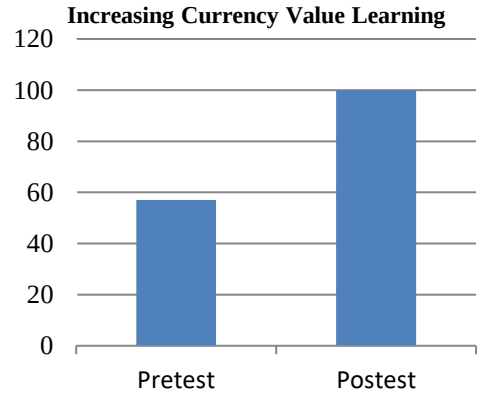
The application of whiteboard digital media for students with mild intellectual impairment in mathematics learning the value of currency has proven to have increased significantly obtained from cognitive learning outcomes in the form of pretests and posttests. Here's a table of data on improving learning outcomes of pretests and posttests subject.

Table 1. Increasing Currency Value Learning

Category	Value
Pretest value	53
Postest value	100
Increased value	47%
Criteria	High

The subject' pretest and posttest learning results in mathematics learning currency values can be seen from the subject's score in the initial pretest, namely getting a score of 53 from the subject's score in the initial pretest, namely getting a score of 53 which shows the subject's initial ability. After being given treatment using digital whiteboard application media, the subject's score became 100. Based on the data obtained, there was an increase in student learning outcomes after being given treatment (intervention) using digital whiteboard application learning media by 47%. In the initial pretest the subject's score did not reach the Minimum Completeness Criteria (KKM) score of 60, but in the final posttest the subject was able to reach the KKM score. For more details, the results of the initial pretest and final posttest assessment of mathematics learning grades can be seen in the following graph :

Picture 10. Grapgic of The Increasing Currency Value Learning Result



Based on the description above, it can be seen that the use of digital whiteboard media in learning mathematics about currency values for students with mild intellectual disabilities, can have a significant effect on improving the quality of student learning outcomes to be better than the value of student learning outcomes in the initial test before being given. web-based learning media intervention, digital whiteboard. This is because using digital whiteboard media can increase students' level of understanding and interest in

learning. The presentation of mathematics learning on currency values through the use of digital whiteboard media can be more attractive and interactive, so that subjects can practice using digital whiteboard media directly, so that the mathematics learning material on currency values becomes easier to understand by mentally retarded students.

Similar Research Findings

Researchers reviewed several findings from similar studies related to the use of interactive digital whiteboard media. Based on several relevant research studies, it is proven that the use of interactive digital whiteboard media can significantly improve student learning outcomes. Interactive digital whiteboard media accommodates students, especially students with intellectual disabilities in understanding learning material more concretely, this contributes significantly to improving the ability of learners to achieve learning goals. Rahman (2014) suggests that students with intellectual disabilities experience obstacles to abstract thinking resulting in difficulty imagining something, so the role of teaching aids is needed for them. The role of teaching aids is needed to help optimize the ability of students with intellectual disabilities, according to Sukotjo (2015) students with intellectual disabilities are individuals who have limitations in the ability to think or use their reason. The limitations of students with intellectual disabilities in abstract thinking require teaching aids in the learning process. According to Bruner's theory (in Sutawidjaja, 2014) that in the selection of learning resources must pay attention to the level of thinking of students, at the elementary school level is at the enactive level, the learning media used starts from direct experience, artificial experience (demonstration), dramatic, demonstration, field trips and performances. Meanwhile, Wijaya (2013) said that learning use sensory modes as much as possible to strengthen student learning.

In developing the level of understanding of students with intellectual disabilities in the learning process, students with intellectual disabilities need learning media that can provide direct experience or artificial experience (demonstration). Thus, digital whiteboard media is an effective medium in improving the perception ability of students with intellectual disabilities in understanding learning material because interactive digital whiteboards are able to accommodate students in accessing learning materials more concretely and in applying their knowledge directly.

The following are the conclusion of the results of the review of relevant research related to the use of interactive digital whiteboards to increase student motivation and learning outcomes in various schools.

Table 2. List of Research Article in Chronological Order

No	Author's (Year)	Title	Design	Purpose	Result
1	Raden Roro Almira Muhammad Adrini (2023)	The Effect of Using Interactive Whiteboard In EFL Context	Qualitative data collection method	This article aims to explore and analyze the effect of interactive whiteboards as instruments for teaching English as a foreign language	Findings from this study indicated that by utilizing smart boards, students were motivated and interested in the learning. Students recognize the value and the effect of the use of the smart boards on their participation in the classroom. The students revealed that technology integration brings an increase in student interaction and facilitates the learning process. The ease in class management allows the

					teacher to spare his/ her time for course-related activities instead of dealing with problems in class management and time. The use of interactive whiteboard in the teaching of English can be recommended as likely to be more effective for teaching English language, in terms of the formal and lexical aspects of English language learning at EFL Context
2	Tim Kühl, et al (2022)	Learning With The Interactive Whiteboard In The Classroom : Its Impact On Vocabulary Acquisition, Motivation And The Role Of Foreign Language Anxiety	Quantitative	The study was designed to gain insight into how the teachers used interactive whiteboard technology (IWBT) in their classrooms, to ascertain their perceptions regarding the use of this technology for students with disabilities (SWD), and to learn about their perceptions regarding professional development needs related to the effective use of IWBT for SWD	Learning with the interactive whiteboard (IWB) was more benefcial than learning without the IWB irrespective of a student's FLCA (Foreign Language Classroom Anxiety). The IWB can motivate students and support their learning. Teaching with the IWB had an infuence on students' performance in the vocabulary test as well as on their motivation. IWB lessons led to a better performance in a vocabulary test than lessons without the IWB
3	Sri Rahayu (2021)	Application Of The Use Of Digital Whiteboard To Student Learning Outcomes On Operations Calculate Fractions In Class 5C SDN Kebraon 2 Surabaya	Quantitative approach	The purpose of this classroom action research is to determine the level of effectiveness of using virtual whiteboards in online learning and also students' perceptions after using virtual whiteboards during learning	Use of digital whiteboards has an influence on improvement grades in calculated operations learning fractional. From the pre-test results that already given, the results are up on average by 4.5 points. The students also feel more able enjoy the lessons and understand deeper lessons
4	Taufiq Ismail	The Influence Of	Research	This study aims	Based on the research can be

	(2020)	Smart Board Media In Improving Student Reading Skills Class IV Light Intellectual Impairment At SLB-ACD Pertiwi Kota Mojokerto	Class Actions	to determine the effect of smart board media in improving the reading ability of grade IV students with mental retardation at SLB-ACD Pertiwi Mojokerjo City	concluded that the use of smart boards can improve reading ability of grade IV lightly impaired students at SLB-ACD Pertiwi Mojokerto City
6	Fatih Saltan (2019)	The New Generation of Interactive Whiteboards: How Students Perceive and Conceptualize?	Mixed method design	The aim of the study was to investigate high school students' perceptions of the new generation of interactive white board (IWB)	This study showed that students in general have a positive perception toward interactive whiteboard (IWB) in terms of their efficiency, contribution to their learning and to their motivation levels. Participants hence also highlighted that IWB are a useful and effective tool for learning
6	Abdulkadir Kirbas (2018)	The Effect Of Interactive Whiteboard Applications Supported By Visual Materials On Middle School Students' Listening Comprehension And Persistence Of Learning	Experimental design	This study was examined how interactive whiteboard application supported by visual materials affected middle school students' listening comprehension and persistence of learning	The research discovered that interactive whiteboard applications affected the listening comprehension and persistence of learning of the middle school students was investigated. it was found that interactive whiteboard applications supported by visual materials were more effective in listening comprehension and persistence of knowledge according to the 2018 Turkish Course Curriculum
7	Ömer Arpacık (2018)	Using Interactive Whiteboards As An Assistive Technology For Students With Intellectual Disability	Qualitative Design	The aim of this study is to investigate the impact of integrating interactive whiteboard (IWB) on students' participation and teachers' teaching practices in a special education school	The results of the research show that with touch the screen, students gainig new behaviors, students with different characteristics showing obsessive behaviours, group work and class control. The use of interactive whiteboards is advantageous in some ways such as having a large screen, supporting multi-media and interaction
8	Nezih Önal (2017)	Use Of Interactive Whiteboard In	Qualitative research	The purpose of the present	Based on the findings, it was revealed that the participants

		The Mathematics Classroom : Students' Perceptions Within The Framework Of Technology Acceptance Model	method	research was to reveal students' perceptions regarding the use of the interactive whiteboard in the mathematics classroom within the framework of the Technology Acceptance Model	had positive perceptions of the use of the interactive whiteboard in the mathematics classroom. Specifically, they found it beneficial because it enabled students to better understand the course, enabled students to be engaged in a meaningful learning and effectual engagement in the classroom, increased students' concentration, and saved time. It was concluded that the participants found the use of the interactive whiteboard useful and easy. Thus, they accepted this technology
9	Dafid A. Allsopp, et al (2016)	Interactive Whiteboard Technology For Students With Disabilities	Qualitative and descriptive methods	The study was designed to gain insight into how these teachers used interactive whiteboard technology (IWBT) in their classrooms, to ascertain their perceptions regarding the use of this technology for students with disabilities (SWD), and to learn about their perceptions regarding professional development needs related to the effective use of IWBT for SWD	Based on the research, interactive whiteboard technology (IWBT) can be differentiated effectively for student with disabilities. Teachers could benefit from assistance to better understand how to differentiate the use of IWBT according to student grouping structure, response type, and disability-related learning need.
10	Carol Le Lant (2015)	Interactive Whiteboards, Students With Intellectual Disability And Oral Language Production	-	The focus of this research was to examine the impact of the use of interactive whiteboards (IWB) on the engagement of students with intellectual disability in early	Oral language production during lessons did differ between the two conditions, with there being evidence of a higher level of relevant verbal elaborations in the lessons taught away from the interactive whiteboard (IWB). This result is important as production of language, particularly elaborated or connected language, helps to

				reading lessons	build knowledge networks and deepen understanding of the task and therefore comprehension. The elaborated language in the non-IWB lessons was found to be up to twice that of the IWB lessons
11	Athanasios S. Drigas, George P(2014)	Interactive White Boards' Added Value InSpecial Education	-	This paper aims to reviewstudies exploring the integration of interactive whiteboard (IWB) in special education, in the last fourteen years (2000-2013)	Research showed that interactive whiteboards are able to keep special education needs students engaged in classroom facilities scaffolding their learning through technical and pedagogical interactivity. This technology has proven its value added to students

The Extent Of The Contribution Of Whiteboard Digital Media To Learning For Students

The use of teaching aids in learning is very necessary for students with intellectual disabilities. Students with intellectual disabilities are individuals with mental barriers that affect abilities cognition. According to Soemantri (2012), cognition ability is an academic skill that complex and related to perception. Perception is the process of the individual in understanding, understanding and interpret any stimulus that found from the environment. Rahman (2014) suggests that students with intellectual disabilities experience thinking barriers abstract resulting in difficult to imagine something, then the role of tools is needed to students with intellectual disabilities. Teaching aids or media must be adjusted to the characteristics and necessity of students with intellectual disabilities who have weak memory and difficulty in abstract thinking. Wijaya (2013) added that the right criteria of props or media used in learning the mentally impaired, should media makes students responsive to material that learned, not easily damaged, harmless, not abstract, usable and easy to obtain.

The use of technology is necessary in education, especially for individuals with disabilities (Williams & Nicholas, 2006). Technology has opened up many opportunities in everyday life, by providing many technological devices. However, the education sector has not really responded to the opportunities of these technological devices. Technological devices may have helped educators and students to engage and interact with each other, as well as interact with lessons. According to Kumpulainen and Wray (2001), interaction is a learning process that is considered a powerful tool used by educators to involve and increase students' interest in learning. Interactive digital whiteboards can help educators and students to improve the learning process. Digital whiteboards are learning media in the form of traditional whiteboards that are integrated with technology so they can be used digitally and can be operated easily because generation Z students are already accustomed to using gadgets. The use of technology-based learning media can stimulate students' interest and motivation to learn. This is in accordance with Barfield's (2003) statement which states that the use of technology to open study units has been proven to stimulate interest and motivate students more than traditional lecture or book approaches. Barfield's statement is supported by the opinion of Gatline (2004) by suggesting that students enjoy the interactive whiteboard multimedia features. Gatline also reported that students became more attentive, more involved and motivated to learn. Other research notes that students'

motivation and attention are the most significant attributes when using interactive whiteboards (Salinitri et al., 2002). Meanwhile, Beeland (2002, p. 2) states that student involvement is very important to motivate them during the learning process. From several expert statements above, it can be concluded that interactive digital whiteboard media is able to attract interest and motivate students in learning, where student motivation and attention in learning is very important so that it can involve student activity during the learning process. Meanwhile, motivation can stimulate involvement/cognitive processes. Active involvement of students during the learning process can certainly improve learning outcomes.

Webster's Ninth New Collegiate Dictionary (1986) describes the act of being engaged as being involved in an activity or showing great interest. It is this type of engagement and active participation for which teachers strive. An interactive whiteboard (IWB) can motivate students to become engaged in learning due to its interactive nature. Intrinsically motivated learners enjoy demonstrating knowledge on the IWB as a means of showing individual achievement (SMART Technologies, 2004). Extrinsically motivated learners are enticed by factor technology and can become motivated learners as a result of the enjoyment they experience when using an IWB. The more students are motivated to learn, the more likely it is that they will be successful in their efforts (Beeland, 2002, p. 2). Interactive whiteboards facilitate student participation through the opportunity to interact with materials on the board (Becta, 2003).

The potential contribution of an interactive digital whiteboard especially for intellectual disability student is significant. Allsopp et al (2012) argue that interactive whiteboard (IWB) increase the interactivity of students with disability, provides interaction, instant feedback and visual. IWB allows using specific content for each student. The use of interactive digital whiteboards for students with intellectual disabilities can increase their interest, motivation and direct involvement during the learning process due to the use of technology-based media that can stimulate and facilitate them in learning according to their climate. Matthew Pugh is argues that, to participate in the learning process helps students engage in a way that would not normally be possible in a classroom situation, adding to the richness of the learning experience (SMART Technologies, 2006, p. 9). The components of an IWB system would address individual needs and promises improved educational results. Students would not be isolated in learning nor have the opportunity to sit passively. Both teachers and researchers alike record increased motivation or the student's drive to participate in the learning process. Technology can be a tremendous aid for a busy teacher trying to ensure that curriculum content reaches special needs students (Wood, 2005).

Students who are engaged in the lesson will be more apt to focus their attention on the lesson. It is assumed that increased attention will lead to increased participation. Research shows students are engaged by the visuals displayed on the IWB. Among the characteristics of student with intellectual disabilities is low interest, concentration and motivation in learning. This is certainly a factor causing obstacles for children with intellectual disabilities in learning. The use of digital whiteboard learning media is the right solution in overcoming learning barriers for students with intellectual disabilities due to technological factors that can stimulate their interest and motivation to learn. With increased interest and motivation, it will allow children with intellectual disabilities to focus attention during the learning process. Furthermore, the use of interactive whiteboard in teaching and learning has a long- lasting impact on children memory and changing their learning style to positive and stimulating experiences. Digital whiteboard media can also facilitates children to be directly involved in its use. Thus, it can improve their learning

outcomes.

Implementation of teaching that integrating the use of interactive whiteboard in the curriculum will more effective and have a positive impact on achievement and the child's education system. Khor Huan & Noraini Mohamed Noh (2016) suggests that classroom teaching and learning using interactive whiteboards (IWB) seem to have positive impact on student achievement. This is supported by the opinion of Thouqan Saleem & Yakoub Masadeh (2016) who stated that, the application of interactive whiteboard (IWB) technology in the classroom creates positivity an environment that appeals to children and indirectly stimulates their understanding of learning of all ages.

Conclusions From Relevant Studies From Different Parts Of The World

As observed in the literature, there are several conclusions obtained related to research on the use of interactive whiteboard (IWB) learning media in the learning process both carried out in regular education and in special education. IWB increases participation and academic engagement for all students via multimedia ability, motivation, efficacy etc (Whitby, Leininger & Grillo, 2012). The results of research from several researchers illustrate that, interactive whiteboards have a significant positive impact on increasing student motivation, interest and engagement, as this tool is something new to them and makes lessons more fun and easy to understand. IWB also increases student participation levels. On the other hand, it supports different learning styles, which means different learners can benefit from it. Through learning using IWB can create an effective learning environment and have a positive impact on children's mastery of learning.

A literature review conducted by Carol Le Lant (2015), concluded that the use of interactive whiteboard (IWB) can produce twice as much spoken language during the learning process as non-IWB. This is evidenced by the level of relevant verbal elaboration being higher. The output of this language is important, especially connected languages can help build knowledge networks and deepen understanding.

Dafid A. Allsopp et al (2016) designed the study to gain insight into how these teachers used interactive whiteboard technology (IWBT) in their classrooms, to ascertain their perceptions regarding the use of this technology for students with disabilities (SWD), and to learn about their perceptions regarding professional development needs related to the effective use of IWBT for SWD. The results of the study showed that IWBT can be differentiated effectively for SWD. Teachers could benefit from assistance to better understand how to differentiate the use of IWBT according to student grouping structure, response type, and disability-related learning need.

Research from Nezih Önal (2017) concluded that the use of whiteboard interactive allows learners to better understand learning, engage effectively and meaningfully in learning, be motivated and can save time. The students were found the use of the interactive whiteboard useful and easy.

Ömer Arpacık (2018) focused on the investigate the impact of integrating interactive whiteboard (IWB) on students' participation and teachers' teaching practices in a special education school. The results of the research show that various findings were obtained about the quality of the used visuals, the use of touch screen, the students gainig new behaviors, students with different characteristics showing obsessive behaviours, group work and class control. The use of interactive whiteboards is advantageous in some ways such as having a large screen, supporting multi-media and interaction.

Research that utilizes the use of interactive whiteboards (IWB) by Taufiq Ismail (2020), shows that the use of smart boards can increase the reading ability of grade IV students with intellectual disabilities experienced mild impairment at SLB-ACD Pertiwi Kota Mojokerto.

A systematic review by Tim Kühl, et al (2022) concluded that learning using interactive whiteboard (IWB) is proven to increase learning motivation, stimulate cognitive process/ engagement and support student learning. IWB lessons led to a better performance in a vocabulary test than lessons without the IWB.

Findings from Raden Roro Almira Muhammad Adrini's (2023) research indicated that by utilizing smart boards, students were motivated and interested in the learning. The students revealed that technology integration brings an increase in student interaction and facilitates the learning process. The ease in class management allows the teacher to spare his/her time for course-related activities instead of dealing with problems in class management and time. The use of interactive whiteboard in the teaching of English be more effective. in terms of the formal and lexical aspects of English language learning at EFL context.

Researchers admit that this research is still far from perfection due to limited insight, time and other things. There are still many things to be completed in this study. Therefore, further research is needed to be better. As a suggestion that research related to digital-based interactive whiteboards, especially as learning media for students with special needs, is needed to support the research that researchers have done, especially by developing internet access, video and sound on digital whiteboard media. This is because digital-based interactive whiteboard media greatly contributes positively to improving student learning outcomes and in accordance with the demands of technological developments.

CONCLUSION

In this research, the findings that the author obtained are as follows :

1. The use of interactive whiteboard digital media is able to improve the ability to understand the mathematics of learning currency values in mild mentally retarded students at junior high school level . Subjects can demonstrate a higher level of mastery of currency values.
2. This research shows that the use of interactive whiteboard digital media has benefits in increasing subject involvement, facilitating understanding of concepts, increasing interest in learning and improving the quality of learning.
3. The use of interactive digital whiteboard media in learning mathematics about currency values provides more interactive, attractive learning and in understanding concepts and in calculating money up to IDR 20,000 better through the available interactive icons.

Based on the description above, it can be seen that the use of digital whiteboard media in learning mathematics about currency values for mild mentally retarded students, can have a significant effect on improving the quality of student learning outcomes to be better than the value of student learning outcomes in the pretest before. given web-based learning media intervention, digital whiteboard. This is because using digital whiteboard media can increase students' level of understanding and learning interest in learning mathematics about currency values. The presentation of mathematics learning on currency values through the use of digital whiteboard media can be more attractive and interactive, so that subjects can use digital whiteboard media directly, so that the learning material on currency values becomes easier for students with mild intellectual disabilities to understand.

The use of interactive whiteboard digital technology-based media is an attractive and innovative learning media, enabling students with intellectual disabilities to be actively involved directly in the process of learning mathematics about currency values. Interactive

whiteboard digital media is effective in improving the subject's conceptual understanding and ability to count money. This research provides an important contribution in the innovative and effective use of web-based interactive whiteboard media for mentally retarded students. This research also proves the significance of using interactive digital whiteboard media in learning mathematics about currency values for mentally retarded students.

The use of an interactive digital whiteboard can build a positive attitude toward children's learning. In addition, the use of digital whiteboard also promotes student-centered learning and active engagement where children will interact with the equipment themselves. They are able to solve specific problems in a fun environment and indirectly enhance their understanding. Children's achievement can be enhanced through learning using digital whiteboard as it creates an effective learning environment and has a positive impact on children. Learning implemented through digital whiteboard interactive will have a lasting impact on children and can improve their achievement.

Acknowledgments

The author would like to thank the empowering lecturer Learning Media and assistant courses willing Learning Media advisors provide guidance in writing this article. We also thank you for your gratitude Sejurnal.com which has assisted in the publication of this article.

REFERENCES

Aaiddinformation. (2008). Frequently Asked Questions on Intellectual Disability and The AAIDD Definition. https://www,aaidd.org

Abdulkadir Kirbas. (2018). The Effect of Interactive Whiteboard Application Supported by Visual Materials on Middle School Students' Listening Comprehension and Persistence of Learning. Universal Journal of Educational Reasearch, 6(11) : 2552-2561, DOI: 10.13189/ujer.2018.061120. http://www.hrpub.org

Ade Yuliana, Salsabila Rizqia. (2022). Media Interaktif Pembelajaran Matematika Berbasis Mobile Bagi Anak Berkebutuhan Khusus [Mobile-Based Mathematics Learning Interactive Media for Children with Special Needs]. Journal Informatics And Electronics Engineering, Vol. 02, No. 02. https://ejournal.poltektedc.ac.id

Akhmad Basuni, Muhamad Sofian Hadi, Misriandi (2023). Evaluasi Keefektifan Pemanfaatan Papan Tulis Interaktif dalam Pembelajaran Kosakata Bahasa Indonesia pada Siswa Kelas Satu SD [Evaluation of the Effectiveness of Interactive Whiteboard Utilization in Learning Indonesian Vocabulary in First Grade Elementary School Students]. JIMPS : Jurnal Ilmiah Mahasiswa Pendidikan Sejarah, 8(3), 2023, 2790-2798. https://doi.org/10.24815/jimps.v8i3.26094

Athanasios S. Drigas, George Papanastasiou. (2014). Interactive White Boards' Added Value in Special Education. International Journal of Online Engineering (iJOE), DOI: 10.3991/ijoe.v10i6.4004. http://dx.doi.org/10.3991/ijoe.v10i6.4004

Atifah Fauzia, Usep Kustiawan. (2017). Multimedia Interaktif untuk Meningkatkan Kemampuan Membaca Permulaan Siswa Tunagrahita [Interactive Multimedia to Improve the Beginning Reading Skills of Mentally Impaired Students]. Jurnal Ortopedagogia, Volume 3 Nomor 1 Juli 2017 : 6-12. https://media.neliti.com

Carol Le Lant. (2015). Carol Le Lant. (2014). Interactive Whiteboards, Students with Intellectual Disability and Oral Language Production. Australian Association for Research in Education. https://files.eric.ed.gov/fulltext/ED593817

Dafid A. Allsopp, et al. (2016). Interactive Whiteboard Technology for Students with Disabilities : A Year Long Exploratory Study. Journal of Special Education Technology, 27(4):1-15. https://www.researchgate.net/publication/286627549

Fatih Saltan. (2019). The New Generation of Interactive Whiteboards: How Students Perceive and Conceptualize ? Participatory Educational Research (PER) Vol. 6(2), pp. 93-102.

http://dx.doi.org/10.17275/per.19.15.6.2
Haiza Hayati Baharudin, Abdul Halim Masnari, Azizah Zain. (2020). The Advantages of Interactive Whiteboard Technology in the Development of Children's Learning. https://www.researchgate.net/publication/348003914
Havivah Fadillatul H., Asep Ahmad Sopandi. (2020). Pelaksanaan Pembelajaran Matematika Bagi Anak Tunagrahita Ringan Kelas IX di Slb Negeri 1 Lima Kaum, Kabupaten Tanah Datar [Implementation of Mathematics Learning for Class IX Children with Light Intellectual Impairment in Slb Negeri 1 Lima Kaum, Tanah Data Regency]. Journal of Multidicsiplinary Research and Development, e-isssn : 2655-0865. https://jurnal.ranahresearch.com
Iwan Zahar. (2009). Belajar Matematikaku [Learn My Math]. Jakarta : PT. Alex Komputindo
Jusmin HJ Wahid, Iwan Irawan, Sumiati Tidore. (2021). The Effectiveness of Electronic Whiteboards on Students' Reading Skills. JOLLT : Journal of Languages and Language Teaching, Vol. 9, no. 1
pp. 69-76. DOI: https://doi.org/10.33394/jollt.v9il.2953
Lexy J. Moleong. (2006). Metodologi Penelitian Kualitatif [Qualitative Research Methodology]. Bandung : PT. Remaja Rosdakarya
Lovandri Dwanda Putra, et al. (2023). Pengaruh Pemanfaatan Media Digital Dalam Mengatasi Kejenuhan Belajar Siswa [The influence of the use of digital media in overcoming student learning saturation]. KAPPA Journal Physics & Physics Education, KPJ 7(2). DOI: https://doi.org/10.29408/kpj.v7i2.20961
Mahdi Azeez Qader. (2021). The Role of Interactive Whiteboards for Enhancing Teaching and Learning in Higher Education. Indonesian Journal of Curriculum and Educational Technology Studies, IJCETS 9(1): 19-24. https://doi.org/10.15294/ijcets.v9i1.48453
Mohammad Idrees Naeemya, Hiroki Yoneda. Students with Intensive Needs in an Inclusive Education System: A Literature Review. Journal of ICSAR. Volume 8 Number 2; DOI: http://dx.doi.org/10.17977/um005v8i2p204
Mumpuniarti. (2011). Pembelajaran Matematika Bagi Siswa Berkebutuhan Khusus Jenjang SDLB [Mathematics Learning for Students with Special Needs at the SDLB Level]. Modul Materi Matematika Bagi SDLB Program Pendidikan dan Latihan Profesi Guru (PLPG)
Nezih Önal. (2017). Use of Interactive Whiteboard in the Mathematics Classroom: Students' Perceptions within the Framework of the Technology Acceptance Model. International Journal of Instruction, Vol.10, No.4, p-ISSN: 1694-609X pp. 67-86. https://files.eric.ed.gov
Nila Kesumawati. Pemahaman Konsep Matematik dalam Pembelajaran Matematika [Understanding Mathematical Concepts in Mathematics Learning]. https://pustaka.ut.ac.id
Ömer Arpacık et. all. (2018). Using Interactive Whiteboards as an Assistive Technology for Students with Intellectual Disability. Journal of Education and Future, issue: 14, 1-14. https://doi.org/10.30786/jet.418054
PSIBK USD. (2022). Tunagrahita [Mentally Retarded]. https://www.usd.ac.id
R. Roro Almira Muhammad A., Yuna Tresna Wahyuna. (2023). The Effect of Using Interactive Whiteboard in EFL Context. Jurnal Ilmiah Wahana Pendidikan, 9(14), 618-624. https://doi.org/10.5281/zenodo.8185634
Sri Rahayu. (2021). Penerapan Penggunaan Papan Tulis Digital Terhadap Hasil Belajar Siswa pada Operasi Hitung Pecahan di Kelas 5C SDN Kebraon 2 Surabaya [Application of the Use of Digital Whiteboards to Student Learning Outcomes in Fraction Counting Operations in Class 5C SDN Kebraon 2 Surabaya]. Jurnal Pendidikan Dasar, Vol.3, No.2, 80-87. https://journal.uwks.ac.id/index.php/trapsila
Taufiq Ismail. (2020). Pengaruh Media Papan Pintar Dalam Meningkatkan Kemampuan Membaca Siswa Tunagrahita Ringan Kelas IV di SLB-ACD Pertiwi Kota Mojokerto [The Influence of Smart Board Media in Improving the Reading Ability of Class IV Light Impaired Students at SLB-ACD Pertiwi Kota Mojokerto]. Special and Inclusive Education Journal. http://jurnal.unipasby.ac.id/index.php/special/index
Tim Kuhl et al. (2022). Learning With the Interactive Whiteboard in the Classroom: its Impact on Vocabulary Acquisition, Motivation and the Role of Foreign Language Anxiety. Education and Information Technologies, 27:10387-10404. https://doi.org/10.1007/s10639-022-11004-

9
Usmaedi. (2021). Education Curriculum For Society 5.0 in The Next Decade. Jurnal Pendidikan Dasar, Volume 4(2). https://stkipsetiabudhi.e-journal.id
Wafiq Roisul Umami, Dwi Cahyo Kartiko. (2022). Pemanfaatan Media Pembelajaran Berbasis Aplikasi Tiktok Pada Submateri Free Throw Bola Basket Kelas X Mait Bic Kota Pasuruan [Utilization of Tiktok Application-Based Learning Media in the Free Throw Submaterial of Class X Mait Bic Basketball Pasuruan City]. Jurnal Pendidikan Olahraga dan Kesehatan Volume 10 Nomor 02. https://ejournal.unesa.ac.id/index.php/jurnal-pendidikan-jasmani
Wikipedia. Matematika [Mathematics]. (2023). https://id.m.wikipedia.org/wiki/Matematika&ved
Wuryani, M. Arif Taboer. (2019). Konsep Dasar Anak Hambatan Intelektual dan Lambat Belajar [Basic Concepts of Children Intellectual Barriers and Slow Learning]. Modul PPG Dalam Jabatan. Kemenristek Dikti.