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Artificial Intelligence (AI) Modeling Technique to Improve Creative Thinking on Number Concepts for Early Childhood with Disabilities

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Abstract

Downsindromes need media to help them focus on learning and understand the material about numbers. Subjects who are classified as active behavior may have creative thinking abilities that need to be explored. The purpose of this study was to determine how the application of video media with artificial intelligence (AI) articulation with modeling techniques and the results of improving creative thinking skills in down syndrome disabilities. Qualitative research with an approach to data analysis using descriptive was conducted to obtain data. The method of interview, observation with the help of video recording was used in data collection. The results of this study state that learning carried out using video media with artificial intelligence articulation with modeling techniques can be applied well, indicated by SDS can be active and focused in participating in learning activities. The increase in creative thinking skills from the beginning has not appeared at all creative thinking skills to the results obtained that SDS has the ability to think creatively with 2 indicators appearing, namely flexibility and originality.
Keywords: *AI, Modeling Techniques, Creative Thinking,*

Introduction

A field of study known as artificial intelligence is responsible for the discoveries and advancements that have led to computers, machines, and other artifacts exhibiting intelligence similar to that of humans, including cognitive, learning, adaptive, and decision-making capacities. Chen, L., Chen, P., & Lin, Z. (2020) that artificial intelligence (AI) has been widely adopted and employed in education, especially by educational institutions . Initially, artificial intelligence (AI) took the form of computers and computer-related technologies. It then evolved into web-based and online intelligent education systems. Eventually, embedded computer systems and other technologies were used, along with web-based chatbots and humanoid robots, to carry out teaching tasks either independently or in conjunction with instructors . A large portion of artificial intelligence in education (AIED) entails applying AI methods to conventional learning frameworks, which frequently replicate (or automate) preexisting educational presumptions and practices (Abdulmunem, 2023). It is very interesting to make the basis that artificial intelligence (AI) is applied to early childhood in the learning process. It is hoped that artificial intelligence (AI) can reduce or improve the quality of the learning process in early childhood. Subjects with early childhood disabilities still need a lot of help to improve the quality of the learning process carried out. One of the disabilities in need is a disability with a deficiency in intelligence, namely down syndrome. Early childhood with down syndrome is

often found to only be able to accept a makeshift learning process without using media that can spur learning activities.

Disability with Down syndrome is a health disorder of the brain and other organs. Down syndrome with the condition is included in disabilities with slow learning. However, in some conditions of children with Down syndrome, children's activities are classified as hyperactive and cannot control themselves. Such conditions result in children not being easy to make them learn calmly and stably willing to listen to the teacher. This condition results in the need for interesting and appropriate learning media in order to attract the attention and interest of children so that they can be conditioned to be calm and willing to learn in an orderly manner. Some children with disabilities have different learning styles including auditory, visual, and kinesthetic. The hearing impaired are more visual and kinesthetic. (Panglipur, 2023a). As for the visually impaired, auditory and kinesthetic learning styles (Panglipur, 2023b). Down syndrome children have learning styles that involve facial or real images so they are closer to visual learning styles. (Pochon et al., 2022). This is why researchers are interested in implementing a learning process with the help of interactive media and can be modeled so that it can be easily understood by children with Down syndrome.

Previous research (Hudha et al., 2016) said that children with disabilities with slow thinking need meaningful learning rather than just learning theory about concepts. Primarily in meaningful mathematics learning by using media that is used as modeling for understanding concepts. While the results of research (Ivanova, 2020) from the point of view of health that optimal development in children with disabilities to change behavior that is less adaptive, technology can be used as a medium to attract attention and help the thinking process in learning so that it becomes better. in disabilities can improve their creative thinking skills by one way of making confidence in the learning process. One way to grow this confidence is by using learning media that involves technology so that it is more interesting. The media is mastered and increases the confidence of children with disabilities. (MalAllah et al., 2022).

Based on some previous research results, some discuss the importance of using media in learning in disabilities. besides that, disabilities can also be honed for their creative thinking skills to be even better. Therefore, researchers are interested in conducting research related to the use of the latest technology, namely artificial intelligence in media in the form of modeling given to children with disabilities. the purpose of this study is to describe the learning activities of children with disabilities with downsindrom using modeling techniques with artificial intelligence to improve children's creative thinking. In the end, the novelty that can be obtained from this research is that media with artificial intelligence-based modeling is used on subjects with down syndrome disabilities to see their creative thinking abilities. This research can be used as a reference later that the learning process in children with Down syndrome can be done and easily with the help of artificial intelligence.

Method

This study uses a qualitative research design developed by Creswell (2014) by using an approach to analyze which is descriptive type. Qualitative researchers choose qualitative research because they collect data in the field directly on site. This means that researchers can collect data close to their subjects by looking at their behavior and actions towards the material under study. Qualitative researchers manage their data by using direct examination, documents, viewing behavior, or interviewing subjects. The qualitative descriptive method shows how the creative process is different. Designing research boundaries, creating research instruments, and collecting information through observation and unstructured or semi-structured interviews,

documents, and visual materials. Data collection was done through face-to-face interviews with subjects using unstructured and open-ended types, in addition to video documentation taken during the research. The instruments used were observation sheets, interview sheets. The next step is to analyze the data and draw conclusions. The results that have been made are used as a basis for providing suggestions for future research. Figure 1 below shows the flow of the research conducted.

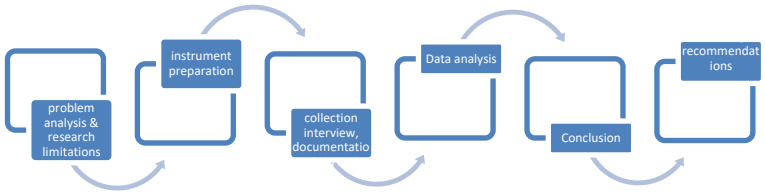

Figure 1. Research flow (Creswell, 2014)

Based on Figure 1, then the data analysis techniques that are classified are descriptive techniques. Data obtained from the encoding to facilitate analysis. The code obtained from the analysis is described according to the problem formula. Descriptive results are represented to facilitate the display and retrieval of research results. Subjects in this study met several criteria: 1) disability with down syndrome type, 2) age 6 – 10 years (primary school), 3) can communicate at a moderate level, 4) parent permission. This study takes as many as one subject according to criteria with the SDS subject encoding. The selection of subjects is carried out in the state of Patrang Jember SLB which is a state of the United Nations with a considerable number of students.

Results

Preliminary data is obtained from preliminary research carried out with the aim of identifying the initial abilities of the subjects/SDS.

Table 1. Preliminary Research Results

informant	interview results	observation result
Orang tua	a. difficulty accompanying their children to study b. not being able to get their children to focus on learning c. do not have learning media that their children like d. not enough knowledge to educate children with special conditions	-
SDS	a. don't like to learn by reading or sitting b. always want to play c. likes to watch videos	a. less like reading more like watching videos b. cannot correctly name numbers and cannot read yet c. always actively moving d. unable to focus on learning activities e. do not want to learn if they do not feel comfortable and happy

Based on the results from table 1, it can be concluded as follows: 1) SDS has not yet understood the numbers well, 2) parents need media help to help in accompanying SDS in learning, 3) media that is interesting and resembles video preferred by SDS. After conducting

preliminary research, the researchers prepared media supported by artificial intelligence with Modelling Techniques that is a video that contains about the understanding of the concept of numbers. Provides an illustration of the number designed with interesting modifications and voices that invite the child to interactively imitate. In Figure 2 below this is a view of the video used in this study.

Figure 2. Video Learning Number Understanding

The researchers conducted research by bringing interviews, video, and static cameras to record activities. From the screenshots of the activity, the researchers will perform observations with the results written on the observation sheet. Below are the results of interviews and observations on number learning activities with SDS using the video media of table 2 below.

Table 2. SDS Interview and Observation Results In Learning

informant	interview results	observation result
SDS	a. liked the video media used b. understand the concept of number c. like learning by watching videos d. like to count their animal toys e. does not understand about money counting f. count snacks given by mom g. likes to collect the same amount of food	a. SDS was seen actively moving but her eyes were focused on the video that was played. b. occasionally responds interactively to the sounds emitted from the video c. follows with sound and finger movements when the video invites to calculate the concept of number d. looks very interested in counting by adding to understand larger numbers e. likes food and gives better expressions when the video involves food in its modeling f. can understand by following the modeling the understanding of larger numbers well

Discussion

On preliminary research results have been obtained that SDS needs alternative assistance that can assist him in the learning process. The primary material that is needed as the basic material is about the concept of numbers. Understand the numbers used in everyday life and form the basis of multidimensional measurement. Andriani et al. (2020) In his research, he stated that his ability to understand the concept of numbers is very close to the activities of everyday life because of the human nature of his society.

Based on the data obtained in this study using the method of interviews and observations with the help of video recordings then some interesting things are found in this investigation. The first is related to the learning activities carried out. The interactive video media that has been dispersed using artificial intelligence can attract SDS interest in learning from the results of interviews and observations. SDS became more fakus in learning and could quietly follow watching the videos well. Similar results associated with video media compilation for disabled can attract interest in learning mathematics (Kellems et al., 2020). Videos with modeling can also help in algebra learning on disabled (Satsangi et al., 2021). The modeling on the video used according to the instructions used by the teacher in accompanying disabled students in algebra learning. So that the algebra skills of the students can their competence well. Besides, SDS is also interactive following the stream delivered by the video. SDS's ability to understand the conceptual material of numbers has also been improved successfully. From the results of preliminary research that SDS has not yet understood well about numbers, however in the research produced data that the SDS is able to understand bilnagn well. The initial ability that actually exists already seems to be staying calling Back and gathered to remember Back Oelh SDS so it actually seems no stranger to this number material to the SDS.

Thanks to the ability to think creatively on SDS we'll see from the results of interviews and observations. On the ability to think creatively according (Bunt et al., 2022) that creative thinking consists of four indicators: fluency thinking, flexibility thinking, elaboration thinking, and original thinking. (originality). SDS's creative thinking skills did not appear in preliminary research, but in research, this creative thinking ability emerged as seen from the ability of SDS to smoothly follow the story in video and follow well here the flexibility emerged. Then SDS is able to understand the concept and with the ability to think it is capable of conducting aggregation using food to understand larger numbers. Here SDS has indirectly succeeded in discovering the latest way in exploring the agglomeration operations first to learn the concept of numbers basically. Originality emerged with the discovery of new concepts in extending the algebra concept of aggregation to learn the conspiracy of larger numbers. Satsangi et al. (2021) stated the results of his research that increased value in terms of smoothness and flexibility of activities carried out by students, that is, that creative drama techniques have helped improve the creative thinking skills of students with intellectual disabilities. As many as 2 creative thinking indicators have emerged in SDS than they originally did not exist. Improved ability of SDS in creative thinking is achieved by being able to meet 2 indicators.

Conclusion

The conclusions that can be drawn from this study are related to two things, namely the application of video media with artificial intelligence articulation with modeling techniques and the results of enhanced creative thinking ability on down disability syndrome. Learning done using video media using artificial intelligences articulation Modelling techniques can be applied well demonstrated with SDS can be actively and focused in following learning activities. Increased creative thinking from the beginning has not appeared at all his creative thinking to the result that SDS has the ability to think creatively with the appearance of two indicators: flexibility and originality.

Recommendation that can be given from the overall investigation activities carried out is related to the development of the video media used can be done trial for more subjects and for subject with other types of disabilities.

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