

The Impact of Serial Image Media on Dyslexia Disorder in Elementary School Mathematics Learning

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Abstract

This study aims to analyze the development of serial image media for students who experience dyslexia disorder in elementary schools in Medan Kota sub-district and to determine the effectiveness of the development of serial image media for students experiencing dyslexia disorder in elementary schools in Medan Kota district. This research method is to use the research and development method (Research and Developmental), which is a process used to develop and validate products. The location of this research was carried out in elementary schools in Medan Kota District, North Sumatera. The conclusions in this study are the development of image media on dyscalculia in primary schools to be developed and applied for students who have difficulty counting.

Keywords

serial image media, dyslexia disorder, mathematics



I. Introduction

One of the problems in learning mathematics at school is learning that has been introduced to children since childhood, such as mentioning numbers, introducing housing, and so on. Education is a very fundamental human phenomenon and also has constructive traits in human life. That's why we are required to be able to hold a scientific reflection on education, as a responsibility for the actions taken, namely educating and being educated (Rangkuti, 2019). Learning mathematics is a very important lesson that must be mastered by children. The inability experienced by children in calculating mathematical elements such as concepts, skills and problem solving can be influenced by phobias of mathematics, weak sighters, inability to sort numbers, inability to imagine, inability to integrate knowledge and experience and understanding problems. story.

According to Rangkuti (2020) teaching in the context of the standard educational process is not just about delivering subject matter, but also as a process of regulating the environment so students learn. Other meanings of teaching are often termed learning. This implies that in the teaching and learning process students must be used as the center of the activity. This is intended to shape the character, civilization, and improve the quality of life of students. Learning is a complex process that occurs in everyone and lasts a lifetime, from a baby (even in the womb) to a hole. One sign that someone has learned something is a change in behavior in him. Changes in behavior are related to changes that are knowledge (cognitive) and skills (psychomotor) and those involving values and attitudes (affective). The learning process will occur well through interactive processes between students and teachers, students with students, and students with learning materials. Besides that students learn naturally, and mental processes occur where students connect new information to relevant concepts.

Learning is a business that is intentionally carried out, directed and planned, with a predetermined goal before the process is carried out, and its implementation is controlled, with the intention of learning to happen to someone. The role of the teacher in overcoming students who are unable to count can also be related to reading difficulties or what is called dyslexia disorder, which is the most important thing in conditioning the different character of students. The special handling that must be given by the teacher should be an important concern because it greatly affects the future of students in the future (Arisandi, 2013).

The causes of learning mathematics difficulties can be caused by 3 factors, namely internal factors, external factors and learning factors. Internal factors that affect student learning outcomes are influenced by low memory, children who depend on sensory organs, children's age, interests, emotions, and motivation / ideals, attitudes and behavior, social concentration, and learning outcomes ability. External factors are influenced by family factors, school factors, and community factors. Meanwhile, learning factors are influenced by teacher, environment, and school factors. The difficulty of counting in elementary school students is identical to the existing subjects in school, namely mathematics.

Rezeki (2020) states that the learning paradigm adopted still tends to be centered on the teacher (teacher centered), with conventional learning methods with a single assumption that knowledge can be transferred intact from the teacher's mind to the learner's mind. The teacher acts as an active subject and students as passive objects and are treated not to be part of what is being taught to them. The learning process is dominated by the teacher, so that it only focuses on emphasizing content recitation, without giving sufficient time to students to reflect on the material presented, students only accept, store, and carry out other activities in accordance with the information provided by the teacher, so that student activity in learning becomes low which results in low interest and student mathematics learning outcomes.

One fundamental principle is that teachers not only provide knowledge to students, but students must also play an active role in building their own knowledge in their memory. In this case, the teacher can make it easy for this process, by giving opportunities to students to find or implement their own ideas, and teach students to be aware and consciously use their own strategies for learning. The teacher can give students steps that take students to a higher level of understanding with their own student notes which they write in their own language and words (Imelda, 2019).

Difficulty learning mathematics in children has a medical connotation, where there is a relationship between health and nerves. The absence of math skills which is expected to interfere with school performance. Mathematical disorders can be grouped into 4 skills, namely first linguistic skills that are linked to understanding mathematical terms and being able to change written problems into mathematical symbols, secondly perceptual skills, where the ability to recognize and understand symbols and sort groups of numbers, the third mathematical skills, namely in the form of addition, subtraction, multiplication, and basic division and sequence of basic operations, the four aensional skills are copying numbers correctly and observing operational symbols well.

In addition to these characteristics, children who experience problems in mathematical relationships also experience problems with spatial relationships, abnormalities in visual perception, visual-motor associations, perseverance, difficulty in recognizing and understanding symbols, impaired body appreciation and difficulties in language and reading. Another thing that is characteristic of children who experience dyscalculia is the first spatial relationship disorder where this disorder is related to front-back, peak-bottom, high-low, beginning-end, etc. Second, the abnormalization of visual perception, where children have difficulty learning mathematics often have difficulty seeing objects, making it difficult to distinguish geometries such as squares, squares, etc. The three visual-motor associations, in

which children have difficulty learning mathematics, are often unable to distinguish objects sequentially while mentioning one, two, three, and so on. The fourth perseverasi is where the child whose attention is attached to an object for a long time. This kind of attention disorder is called perseveration. Fifth, Difficulty understanding symbols, Children who have difficulty in this case have difficulty recognizing mathematical symbols. The sixth, body appreciation disorders, where the child finds it difficult to understand the relationship of the parts of his own body, such as if the child is asked to draw a complete picture, for example a drawing of a person, then the child will describe incomplete body parts. Seventh, difficulty in reading, this difficulty occurs because of not being able to see the symbols related to the story and story problems.

II. Review of Literatures

Pohan (2020) states that until now mathematics was still considered a difficult, boring, even scary subject. This assumption may not be excessive in addition to having an abstract nature, a good understanding of mathematical concepts is very important because to understand the new concepts required preconditions of understanding the previous concepts. While from the teacher's side, the teacher is required to choose the right learning approach in accordance with the material presented in order to achieve the learning objectives. Thus, learning mathematics becomes more meaningful (meaningfull), students not only learn to know something (learning to know about), but also learn to do (learning to do), learn to animate (learning to be), and learn how they should learn (learning to learn), and learning to socialize with friends and the environment (learning to live together).

According to Pohan (2020) one of the mathematical skills that students must possess and achieve is problem solving. Problem solving is very close to mathematical characteristics. Problem solving (problem solving) is a process carried out to reach logical conclusions based on knowledge relating to facts and various relevant sources. Problem solving activities must be done by students, if they do not do the activity of thinking while learning, then what they get is just memorization and does not understand the core or concept of the material that has been learned. With the existence of problem solving activities when learning, students will arrive at the correct conclusions about the material being studied because it has gone through a logical thinking process when learning. In the learning process, students who experience learning difficulties will appear when they are unable to understand arithmetic concepts or recognize arithmetic symbols such as add, less, divide, times, and roots (Astuti et al., 2014).

According to Tarigan (2020) Therefore, it must use learning media that are as attractive as possible, especially the teaching materials used. Teaching materials are materials or subject matter that are arranged systematically, which are used by teachers and students in the learning process. Teaching materials used can be in the form of Student Worksheet.

Serial image media is an image media that describes a series of stories in sequence according to the topics contained in the image. Therefore the use of serial image media is one of the effective learning media by combining facts, ideas clearly derived from the image (Roncancio R, Ginna & Sáenz G, 2016)

Image media for students who experience reading difficulties (dyslexia) and difficulty counting in elementary schools is learning that is used as a learning process that uses digital media in the learning process. The development of image media is learning that develops on the basis of conventional learning that is unable to understand the circumstances and needs of students. In line with the times, technological developments using digital devices are starting to be used in schools [Akhmadi, 2012].

The use of image media applications in education positively affects the awareness, knowledge, and attitudes of students who experience dyscalculia. The development used in accommodating the need for dyscalculia with image media is using images that contain support for positive attitudes towards learning so as to motivate students in learning. The use of a device contains education that is in accordance with the needs of dyscalculia and is designed to use the device that will be used by the teacher [Osman, 2015].

III. Research Method

This type of research is a research development (Research and Development) with descriptive quantitative and qualitative methods. This type of research is due to the aim of developing interactive educational multimedia applications based on cognitive theory on dyscalculia in elementary schools. The subjects of this study are students who have difficulty reading or are called dyscalculia, while the object of this research is the image media.

The variables involved in this research can be explained in the operational definition as follows:

- a. The determination of the validity of text quality is based on the assessment of educational psychologists who understand interactive educational multimedia. The validation sheet contains an assessment of quality indicators on the content / content of the text and the development of the application.
- b. Student activities are activities carried out by students who experience dyscalculia in implementing image media development
- c. Teacher activities are activities carried out by teachers in developing image media.
- d. The impression of students and teachers is the assessment responses given by teachers and students in the implementation of image media development
- e. The results of reading ability are the results obtained by students in the ability to answer and read a given text

Data analysis in this research will be divided into, interactive media validation data analysis through two stages, namely qualitative and quantitative descriptive analysis. Qualitative analysis techniques are descriptive, not numerical. This data analysis technique was carried out by grouping information from qualitative data in the form of input, response, criticism, and improvement using a budgetary scale with a liker scale, and for media validation two stages were used, namely a) review by content experts and design experts, b) testing individual, small group trials and field trials. The subject of the product trial results of this research and development is students who experience dyslexic, one person field trials. The data collected through the implementation of formative evaluation are grouped into two parts, namely; 1) data from the first stage of evaluation in the form of data from expert reviews from teachers and 2) data from the results of individual trials, group trials and field trials in the form of reviews from students. And the indicators of the success of this study are:

1. Multimedia validity with minimal category is good
2. The interactive effectiveness of educational multimedia on dyscalculia by administering a questionnaire with a good category

IV. Discussion

The result of this research is that the validation of the image media expert is valid in terms of appearance, operational, and interaction aspects. The percentage score for the display aspects given by the validator was 89.60%. For the operational aspect, the data obtained a percentage score of 95.33% and the interaction aspect of the validator gave a percentage score of 93.53%. Based on these data, the learning media developed can be categorized as very good and suitable for use as supporting analysis. Furthermore, the experiment was carried out on students by giving examples to students and doing it themselves. After students use this learning media, it is carried out by measuring the media by giving a questionnaire that is filled in by the student. The plan for the next stage in this research is the development of image media for dyslexic students so that it can help students with dyscalculia as early as possible. Judging from the aspect of appearance, operational aspects and aspects of interaction that this learning media to help dyscalculia is feasible to be developed and applied. Furthermore, the next stage plan is to design the image media software on dyscalculia. The aim is to make it easier for students who have difficulty learning to use it so that it can be resolved as early as possible. The plan for the next stage is the development of interactive multimedia for other media such as serial image media which is associated with other learning difficulties such as numeracy and writing difficulties. By connecting it will be very useful for students who have difficulty learning in this regard.

V. Conclusion

The conclusions in this study are the development of image media on dyscalculia in primary schools to be developed and applied for students who have difficulty counting. From the conclusions of the study, there are several things, namely:

1. Learning media with the developed image media is valid
2. Learning media with picture media are good for developing and applying for students who experience dyscalculia
3. Effectiveness of image media against dyscalculia

The conclusion of the study there are several suggestions in interactive educational multimedia learning, namely:

1. For teachers to be able to provide an approach that suits the needs of students who experience dyscalculia.
2. For further researchers, it is hoped that they will be able to develop other variables in developing solutions for students who experience dyscalculia.
3. The results of this study need to be applied in elementary schools where students have difficulty learning.

References

- Agung, A. A. G., Widiana, I. W., & Indrasuari, N. K. S. (2017). *Pengembangan Aktivitas Pembelajaran Mengasosiasi Berbasis Media Gambar Berseri Dalam Meningkatkan Proses Kognitif Siswa. 1*, 138–146.
- Arisandi, E. (2014). Meningkatkan Kemampuan Operasi Perkalian untuk Anak Diskalkulia melalui Metode Garis Matematika. *Jurnal Ilmiah Pendidikan Khusus*, 3(3), 478–488.
- Astuti, Y. W., Mustadi, A., & Yogyakarta, U. N. (2014). Effects of the use of animation film media on the narrative text writing skill of grade V students of ESs. *Jurnal Prima Edukasia*, 2(2), 250–262.
- Osman, W. A. J. W. Yahaya, and A. C. Ahmad, “Educational Multimedia App for Diskalkulia Literacy Intervention: A Preliminary Evaluation,” *Procedia - Soc. Behav. Sci.*, vol. 176, pp. 405–411, 2015.
- Media, P., & Berseri, G. (2017). *Penggunaan Media Gambar Berseri untuk Meningkatkan Keterampilan Menulis Narasi Siswa Kelas IV SDN Tambak Kemeraan Kecamatan Krian Apriliya Susanti*. 1–11.
- Roncancio R, Ginna & Sáenz G, C. (2016). Pengembangan media gambar berseri. *IOSR Journal of Economics and Finance*, 3(1), 56. <https://doi.org/https://doi.org/10.3929/ethz-b-000238666>
- Agung, A. A. G., Widiana, I. W., & Indrasuari, N. K. S. (2017). *Pengembangan Aktivitas Pembelajaran Mengasosiasi Berbasis Media Gambar Berseri Dalam Meningkatkan Proses Kognitif Siswa. 1*, 138–146.
- Arisandi, E. (2014). Meningkatkan Kemampuan Operasi Perkalian untuk Anak Diskalkulia melalui Metode Garis Matematika. *Jurnal Ilmiah Pendidikan Khusus*, 3(3), 478–488.
- Astuti, Y. W., Mustadi, A., & Yogyakarta, U. N. (2014). Effects of the use of animation film media on the narrative text writing skill of grade V students of ESs. *Jurnal Prima Edukasia*, 2(2), 250–262.
- Imelda, and Anzelina, D. (2019). Students’ Activities in Learning with Problem Based Learning Based Budapest International Research and Critics in Linguistics and Education (BirLE) Journal Vol 2 (4): 552-559.
- Media, P., & Berseri, G. (2017). *Penggunaan Media Gambar Berseri Untuk Meningkatkan Keterampilan Menulis Narasi Siswa Kelas IV SDN Tambak Kemeraan Kecamatan Krian Apriliya Susanti*. 1–11.
- N. Akhmadi, “Riset Kebijakan Pendidikan Anak di Indonesia,” *Ris. Kebijak. Pendidik Anak di Indones.*, p. 515, 2012.
- N. Hayati C. M. Vijayaletchumi, Shamsilah Roslan, Yong Chyn Chye, “Multi-Senses Explication Activities in Words Mastery Among Dyslexic Children,” *IJSR - Int. J. Sci. Res.*, vol. 2, no. 2277, pp. 535–540, 2013.
- Pohan, A.M., Asmin, and Menanti, A. (2020). The Effect of Problem Based Learning and Learning Motivation of Mathematical Problem Solving Skills of Class 5 Students at SDN 0407 Mondang. *Budapest International Research and Critics in Linguistics and Education (BirLE) Journal Vol 3 (1)*: 531-539.
- Rangkuti, A.N., and Hasibuan, W.S.. (2019). Learning of Spatial Operations in 1st Grade of Junior High School (MTs.S NU Paringgonan) Ulu Barumun Sub-district Padang Lawas Regency. *Budapest International Research and Critics in Linguistics and Education (BirLE) Journal Vol 2, (1)*: 181-193.

- Rezeki, R., Sitompul, H., Situmorang, J. (2020). The Effect of Learning Strategies and Cognitive Styles on Learning Outcomes of Mathematics after Controlling Intelligence. *Budapest International Research and Critics in Linguistics and Education (BirLE) Journal* Vol 3 (2): 1151-1163.
- Roncancio R, Ginna & Sáenz G, C. (2016). Pengembangan media gambar berseri. *IOSR Journal of Economics and Finance*, 3(1), 56. <https://doi.org/https://doi.org/10.3929/ethz-b-000238666>.
- Tarigan, E.E., Hasratuddin, and Fauzi, K.M.A. (2020). Development of Students Work Sheet Based on Realistic Mathematic Approach with Ethnomatematic nuanced to Improve Critical Thinking of 4th Grade Students in Primary School (SD Negeri 091358 Haranggaol, Haranggaol Horisan Sub-District). *Budapest International Research and Critics in Linguistics and Education (BirLE) Journal* Vol 3 (1): 133-143.